June Lake Public Utility District
Water Resource Assessment

Technical Memorandum No. 4
Rodeo Grounds Development
Surface Water Availability

June 2006

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation
444 North Third Street, Suite 325
Sacramento, CA 95814-0228
916-441-6850
916-448-3866 *fax*

Wagner&Bonsignore
Consulting Civil Engineers, A Corporation

Nicholas F. Bonsignore, P.E.
Robert C. Wagner, P.E.
Paula J. Whealen
Andrew T. Bambauer, P.E.
David M. Houston, P.E.
Ryan E. Stolfus

TECHNICAL MEMORANDUM NO. 4

To: Mr. John Enloe, P.E., ECO:LOGIC Consulting Engineers

From: Nicholas F. Bonsignore, P.E.

Date: June 7, 2006

Re: **June Lake Water Resource Assessment**
Rodeo Grounds Development
Surface Water Availability

This Technical Memorandum No. 4 provides an evaluation of surface water resources available to the June Lake Public Utility District (JLPUD) in connection with service to the proposed Rodeo Grounds Development. The work was performed pursuant to Sub-Task B.2 of our service agreement dated July 22, 2005, and included an evaluation of previous studies, a site visit and meeting with JLPUD personnel, an analysis of surface water resources available to JLPUD based on various sources of hydrologic data, an evaluation of historic June Lake level data, a review of future water demand estimates prepared by Catherine Hansford, and an estimate of impacts to June Lake levels due to projected increased demand.

Conclusions and recommendations are provided in Sections 1.4 and 1.5, respectively. Given the lack of local hydrologic data available we were unable to evaluate, in detail, water availability meeting the requirements of SB610 and SB221 for the demand scenario associated with the Rodeo Grounds Development. However, recommendations are provided for gathering additional data that would provide the supporting information.

A Table of Contents and list of Tables, Figures, Plates and Appendices are provided on the following pages, followed by technical discussion of surface water availability in the June Lake region.

444 North Third Street, Suite 325, Sacramento, California 95814-0228
Ph: 916-441-6850 Fx: 916-448-3866

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1.0 INTRODUCTION, CONCLUSIONS AND RECOMMENDATIONS

1.1 Authorization

This Technical Memorandum provides an evaluation of the hydrologic adequacy of existing water sources presently relied upon by June Lake Public Utility District (JLPUD) to meet projected build-out demands plus estimated demands associated with the proposed Rodeo Grounds Project. The scope of work is set forth under Subtask B.2, Surface Water Availability, in the Subconsultant Agreement for Professional Services between Wagner & Bonsignore, Consulting Civil Engineers, and ECO:LOGIC Consulting Engineers dated July 22, 2005, and includes the following:

- Evaluate previous studies on historical surface water data in the region that have been provided by JLPUD and others.
- Make a site visit to obtain an understanding of the operation of June Lake and JLPUD diversions.
- Estimate surface water resources available to JLPUD based on analysis of historical precipitation data and discharge records of nearby watersheds.
- Evaluate historical data for June Lake levels.
- Review future water demands associated with the proposed Rodeo Grounds project and build-out elsewhere in JLPUD's service area.
- Estimate changes in June Lake levels due to increased demand.
- Estimate water availability for the proposed demand scenario under extremely dry, dry, wet and normal year conditions in accordance with SB610 and SB221.

The scope of work also indicates that if there is insufficient data available to address the requirements of SB610 and SB221, then an outline of additional data and information required shall be provided.

1.2 Previous Studies

In April 1981, the California Department of Water Resources (DWR) issued a report entitled *June Lake Area Water Resources Assessment Study* (1981 Assessment Study). The primary objective of the 1981 Assessment Study was to "provide June Lake Public Utility District and other interested agencies with technical information pertaining to the hydrologic and geohydrologic conditions of the study area", and to "provide the information regarding local water supplies needed to local, State, and other agencies, to solve water-related problems so as to ensure a realistic and orderly development of the

June Lake Area." Findings and conclusions from the 1981 Assessment Study germane to the present study are summarized below:

> *"Precipitation (both rainfall and snowfall) within the June Lake area constitutes its only source of inflow; most of the precipitation occurs during November through March."*
>
> *"Few measurements have been made of streamflow within the June Lake area. Those taken in 1979 indicate that the flow rate peaks in January through May."*[1]
>
> *"There are not enough hydrologic data for completing the hydrologic balance. For instance, without the complete set of information on the inflow and outflow and June Lake's water level changes, dynamic relationships between lake levels and various hydrologic conditions could not be determined."*

Recommendations from the 1981 Assessment Study pertinent to the present study include the flowing:

> *"For future hydrologic data collection efforts, time-sequenced data should be obtained to allow for a complete dynamic hydrologic balance."*
>
> *"As part of the proposed data collection program, monitoring activities should be implemented to collect data on lake levels and water quality."*

DWR's 1981 recommendation for a data collection program, key elements of which would include monitoring June Lake levels and measuring local streamflows over time, was not fully implemented.

1.3 Available Hydrologic Data

JLPUD has monitored June Lake levels since May 2004 and Fern Creek flows since June 2004. This data provides limited useful information. In the mid-1980s, JLPUD operated flow measuring stations on Reversed Creek below its outlet from Gull Lake and on Snow Creek at the JLPUD diversion. This data could not be found at the JLPUD office, however, a general summary of some of the data collected is presented in the June Lake 2002 Master Environmental Assessment prepared by the Mono County Planning Department. To the best of our knowledge no other governmental agency has conducted lake level or streamflow measurements in the Reversed Creek watershed since the 1981 Assessment Study was issued, therefore, a significant body of new local hydrologic data has not been collected.[2] Accordingly, the analysis and findings presented herein rely to a large degree on extrapolations of the minimal amount of data collected by JLPUD in

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[1] Our review of hydrologic data for the region indicates that peak flows are more likely to occur later in this period than earlier.

[2] JLPUD has recently installed a flow measuring device at its Snow Creek diversion facility.

2004 and 2005, anecdotal accounts from individuals familiar with local history and conditions, and regional hydrologic data collected by other entities, including the Los Angeles Department of Water & Power (LADWP) and Southern California Edison (SCE).

1.4 Conclusions

Our conclusions are provided below, reiterating that they are based to a large extent on conservative extrapolations of the minimal amount of actual data available:

- Water supplies available to the JLPUD Village System appear to be adequate to meet the existing demand with a minimal effect on June Lake levels. From 1990 to 2003 JLPUD annual diversions from June Lake averaged about 19.8 acre-feet. This amount represents a depth of about 0.8 inches over the surface area of June Lake at full pool per year. For the period of 1999 to 2003, the corresponding values are 12.7 acre-feet and about 0.5 inches per year.

- During the low-flow season following dry water years Snow Creek flows appear to be insufficient to meet projected increased demands associated with build-out of the JLPUD Village system (excluding Rodeo Grounds) or development of only the Rodeo Grounds.

- Under average water year conditions it appears that inflow to June Lake is marginally in excess of outflow.

- Based on the topography of the June Lake watershed and the lack of a single primary source stream, direct measurement of inflow to June Lake does not appear to be feasible.

- Anecdotal accounts of fluctuations of as much as 3 feet in the level of June Lake over the last 6 to 7 years, if accurate, are likely due to below-average precipitation occurring during this period. The average departure from long-term average annual precipitation appears to have been in excess of 25 percent during this period.

- Reliance on increased June Lake diversions to offset Snow Creek supply deficits for projected demands will accelerate drops in June Lake levels. Relative to existing average rates of diversion, projected diversions from June Lake could result in increased drops in June Lake levels in the range of about 1 to 4 inches per year under dry year conditions, depending upon the extent of future development.

- A change in climatic pattern to wetter-than-average conditions could restore June Lake levels to historical norms. It is uncertain if and when a change to a wetter pattern will occur.

- Flows in Fern Creek, which supplies JLPUD's Down Canyon System, do not appear to be sufficient during low-flow periods following dry water years to meet existing Down Canyon demands while concurrently complying with State-mandated minimum in-stream flow bypass requirements. Accordingly, Fern Creek cannot be relied upon to offset estimated shortfalls in supply from Snow Creek to meet future Village System build-out or Rodeo Grounds demands.

- Sufficient information is not available to quantify water availability under all of the various water year conditions set forth in Section 1.1 above. A more definitive assessment will require field measurement of various climatic and hydrologic parameters. General recommendations for such a program are set forth in Section 1.5 of this Technical Memorandum.

1.5 Recommendations

The following recommendations are proposed for developing a more-definitive assessment of water availability for projected demands:

1. The present hydrologic data collection program should be enhanced to conform to that recommended in DWR's 1981 Assessment Study. The program should be focused on the following objectives:

   - Defining the apparent relationship between annual or multi-year climatic conditions and June Lake levels.

   - Determining natural flow characteristics for JLPUD source streams (Snow Creek, Fern Creek, and the unnamed stream), and Reversed Creek throughout the year and under varying water year conditions.

2. The data collection program, at a minimum should include, but not necessarily be limited to, the elements listed below. Presumably, the project proponent cannot afford to wait for many years while hydrologic data is collected. The data collection program should therefore be directed towards assessing whether relationships exist between local flows and other climatic parameters for which long-term data is available:

   - Establishment of a measuring point elevation at the June Lake Water Treatment Plant intake and an elevation for the June Lake overflow, both tied to a known and locally acceptable vertical datum and DWR's topographic map of June Lake.

   - Continued collection of streamflow data at Fern Creek and Snow Creek.

   - Verification of the accuracy of the bypass flow measuring device at Fern Creek using direct measurement techniques. Uniform procedures should be established and followed for operating the device and recording data concurrent with water production at the Clark Water Treatment Plant.

- The operability of a Parshall flume reportedly still in place in Reversed Creek at the Gull Lake outlet should be investigated. If the flume is still in workable condition, a continuous stage measuring and recording device should be installed. If the exposed location of the flume precludes the secure installation of such a device, then daily measurements of head should be observed manually and recorded.

- Desirable, but optional, elements of the data collection program would include the installation of an appropriate precipitation gage within the June Lake watershed, an appropriately-sited evaporation pan near June Lake, and a flow measuring device at JLPUD's diversion on the unnamed stream.[3]

3. The beneficial uses of June Lake should be defined (if they have not already been defined), with the objective of determining a criterion for acceptable limits in Lake drawdown. For example, John Fredrickson, owner of the June Lake Marina, reports that the drop in lake level over the last 6 years has presented a hardship for the operation of the June Lake Marina. Based on the notion that at some time in the future wet periods will occur that will return the level of June Lake to normal, tolerance thresholds for Lake drawdowns should be established based on various beneficial uses of the Lake.

4. The in-stream resources of the JLPUD source streams should be evaluated (if they have not already been so evaluated) to assess the potential for adverse impacts to in-stream resources caused by potential future reductions in flow associated with increased demand.

2.0 PROJECT SETTING

2.1 Regional Setting

The proposed Rodeo Grounds project is located within the watershed of Reversed Creek, tributary to Rush Creek in the Mono Basin of northern Mono County (see Plate I). The Rush Creek watershed encompasses about 32,900 acres (51.4 square miles) above Grant Lake, which is a natural lake that was enlarged by the construction of a dam by the Los Angeles Department of Water & Power (LADWP) in 1940.

The Rush Creek watershed is generally bounded on the south and west by the high Sierra Mountains, on the east by Mono Craters area, and on the north by plains bordering the southern perimeter of Mono Lake. Elevations within the Rush Creek watershed range from about 7,200 feet to almost 13,000 feet. The climate is characterized by cold winters

[3] SCE has removed its precipitation gage at Gem Lake, and may replace it soon with more modern equipment. If SCE does not replace the gage, an alternative source of precipitation data will be required for tracking precipitation in the June Lake area.

and warm summers. Development within the watershed includes residential and recreational development within the Reversed Creek tributary watershed (discussed further below), power generation facilities operated by Southern California Edison (SCE) at Gem Lake and Agnew Lake, and resort and camping facilities at Silver Lake.

2.2 Local Setting

Reversed Creek joins with Rush Creek about a quarter-mile upstream of Silver Lake. The Reversed Creek watershed encompasses about 9,800 acres (15.3 square miles), and includes two major naturally occurring lakes, Gull Lake and June Lake (see Plate I). Elevations within the Reversed Creek watershed range from about 7,200 feet to about 11,600 feet. Reversed Creek has been observed to run year-round, and is fed by several perennial tributaries that emanate from the mountains on the south side of the watershed, and by overflows from Gull Lake. Development within the watershed includes the residential and resort communities of the June Lake Village and the Down-Canyon area, both of which are served by the June Lake Public Utilities District (JLPUD), and the June Mountain Ski Resort. The area offers both winter and summer recreational opportunities.

2.3 June Lake Public Utilities District

JLPUD serves potable water and provides wastewater collection and treatment services to residential, resort, and commercial customers located within its service area. JLPUD operates two separate water distribution systems, one serving the area around June Lake and Gull Lake referred to as the Village System, and the other serving the area between Gull Lake and Silver Lake referred to as the Down-Canyon System (see Plate 2). The two systems have separate water sources.

The Village System obtains most of its water supply from Snow Creek (also know as Twin Springs Creek), which is located in hills immediately west of the June Mountain Ski Resort. Water diverted at Snow Creek is conveyed by gravity pipeline approximately 0.8 miles northeasterly to the Snow Creek Water Treatment Plant. The Village System is also supplied by water drawn from June Lake. Water is pumped from the Lake at JLPUD's June Lake Water Treatment Plant located on the southeasterly shore of June Lake.

The Down-Canyon System obtains its water supply from Fern Creek and from an unnamed spring-fed stream located between Fern Creek and Snow Creek; both sources are located in the hills on the south side of the Reversed Creek watershed. Water diverted at Fern Creek is treated at the Clark Water Treatment Plant, and water diverted at the unnamed stream is treated at the Petersen Water Treatment Plant.

Presently, JLPUD has approximately 690 water connections which serve approximately 480 permanent residents (about 220 in the Down-Canyon System and about 260 in the Village System).[4] During peak recreation periods the visitor population can reach in

[4] Communications from Mindy Pohlman, General Manager, June Lake Public Utility District, August 23, 2005, and September 19, 2005.

excess of 3,000.[5] As shown in Table 2-1, for the period of 1990 to 2003 annual production averaged 119.9 MG (367.9 acre-feet) system wide. Monthly production for calendar year 2004 and part of 2005 is provided in Table 2-2. In 2004 the peak month for production was July (15.48 MG, 47.5 acre-feet), and the lowest production month was February (4.94 MG, 15.2 acre-feet).

The JLPUD 2004 Master Plan Update provides estimates of build-out demand both with and without the Rodeo Grounds project. More recently, the projected demand associated with the Rodeo Grounds has been updated, resulting in the following projections for future JLPUD annual demand for the Village System:

Demand Parameter	Without Rodeo Grounds	Rodeo Grounds Only	Total Build-out
	(af)	(af)	(af)
Existing demand[6]	170	170	170
Incremental projected demand	121 [7]	102 [8]	224
Total demand	**291**	**272**	**394**

2.4 Geology and Soils

A detailed geologic and soils evaluation was not part of our scope of work, however, a reconnaissance-level review of local geology and soils offers some insight into hydrologic characteristics of the June Lake region.

2.4.1 Geology

June Lake is underlain by a geologic unit identified as "Granite of June Lake (late Cretaceous)."[9] The age of the late Cretaceous Period is at least 65 million years old. A marked change in geologic units occurs just west of June Lake at the easterly margin of Gull Lake. Gull Lake is underlain by a geologic unit identified as "Sedimentary and

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[5] June Lake Public Utility District 2004 Master Water Plan Update, Boyle Engineering Corporation, August 2004.

[6] Ibid., Table 5, based on period of record of 1992 to 2003.

[7] Ibid., derived from Table 6.

[8] Catherine Hansford, Draft Technical Memorandum No. 2, Subtask A.2, Rodeo Grounds Water Demands, May 23, 2006.

[9] Pre-tertiary Bedrock Geologic Map of the Mariposa 1º By 2º Quadrangle, Sierra Nevada, California; Nevada, by Paul C. Bateman, 1992.

metasedimentary strata (Devonian, Silurian?, and Ordovican)." These geologic periods occurred between 345 and 500 million years ago, and are therefore much older than the granite formation at June Lake.

The region is considered active geologically. Numerous Holecene-age faults trend through the June Lake region in a north-south orientation.[10] One active fault in particular is shown at the western perimeter of June Lake, possibly at the geologic interface noted above.

2.4.2 Soils

Soils information is available from the Soil Survey for the Inyo National Forest, published by the U.S. Department of Agriculture, Forest Service (June 1995). The Soil Survey provides detailed mapping of individual soil units and descriptions of soil properties to a depth of about 5 feet. Excerpts from the Soil Survey are provide in Appendix A of this Technical Memorandum. The various soil units mapped within the watersheds of June Lake and Gull Lake share similar hydrologic characteristics, as follows:

Hydrologic Soil Group:	Group A – "Low runoff potential. Soils having high rates of infiltration and water transmission when wet. They are mostly deep, well-drained to excessively drained sands and gravels."
Restrictive Layer Depth:	Restrictive layer depth refers to a zone within the upper 60 inches of the soil profile that would impede or stop the downward movement of water. For most of the mapped soil units the restrictive layer depth is generally greater than 60 inches.
Available Water Capacity:	Available water capacity in the upper 60 inches of soil generally ranges from Very Low (0.5 inches) to Moderate (4.4 inches).
Drainage Class:	All of the subject soils are identified as *somewhat excessively drained*, meaning that water is removed from the soil rapidly.

The foregoing soil characteristics suggest that precipitation (rain and melting snow) would tend to infiltrate rather than run off. The depth of infiltration is unknown, but sustained stream and spring flows in the region during the dry season suggest that infiltration of precipitation plays a major role in maintaining these flows during low-rainfall periods. The tendency for precipitation to infiltrate rather than run off also appears to play a major role in maintaining lake levels in the region.[11]

[10] Fault Activity Map of California and Adjacent Areas compiled by Charles W. Jennings, 1994.
[11] Department of Water Resources, June Lake Area Water Resources Assessment, April 1991, Page 15.

3.0 CLIMATIC CONDITIONS

Climatic conditions pertinent to this study include seasonal temperature, precipitation, and evaporation from lake surfaces. Each of these parameters is discussed in the following sections.

3.1 Seasonal Temperatures

Seasonal temperatures are characterized by cold winters and warm summers. Diurnal and seasonal variations in temperature are characteristic of the area. Temperatures tend to decrease with increasing elevation, although cold air drainages and winter temperature inversions can reverse this trend. Mean daily summer temperatures are usually between 60 and 65 F°, while mean daily winter temperatures (December through February) are usually below freezing. Summer daily maximum temperatures normally range from 75 to 85 F°. Winter daily maximum temperatures are often above freezing. Significant daily temperature fluctuations of between 40 to 50 F° are common in the winter.[12]

June Lake reportedly freezes over every winter.[13] Warming temperatures in the late spring and early summer result in peak flows during that period due to melting snow.

3.2 Precipitation

Precipitation occurs regionally as rain and snow, depending upon the time of year. An isohyetal map in DWR's 1981 Assessment Study indicates that total mean annual precipitation for the Rush Creek watershed above Grant Lake ranges from 20 inches at June Lake to over 50 inches in the higher elevations of the watershed.[14] Within the Reversed Creek watershed, mean annual precipitation is similarly shown to range from 20 to 50 inches. The DWR data was based on precipitation records for Water Years 1952 to 1978.[15]

Southern California Edison (SCE) tracked precipitation at Gem Lake from 1925 to 2004. The precipitation gage that has been used at Gem Lake is somewhat primitive by modern standards, and it is located in a protected area at the base of Gem Lake Dam. The pure accuracy of the gage is questionable, however, the data collected is considered to be consistent and suitable for assessing precipitation trends over time.[16, 17] A summary of

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[12] Mono County Planning Department, June Lake Master Environmental Assessment, 2002.

[13] Personal communication with Wes Johnson, Game Warden, Department of Fish & Game (retired), October 17, 2005.

[14] Figure 3 from June Lake Area Water Resources Assessment Study, California Department of Water Resources, April, 1981.

[15] A "Water Year" as used in this report runs from October to September.

[16] Personal communication with Neil Sliger, Southern California Edison, October 11, 2005.

monthly and annual accumulated precipitation for this station is provided on Table 3-1. The accumulated annual departure from long-term average for this station for two time periods is shown graphically on Figure 1. The following observations can be made based on the Gem Lake record:

- The record is complete for the period of WY 1925 to 1998, 2000, 2001 and 2004. Data is missing for some months in WY 1999, 2002, and 2003, however, the missing data generally occurs in the late spring to early fall when precipitation would be relatively low. January is the maximum month for precipitation (3.57 inches on average), while June is the lowest month (0.52 inches).

- Mean annual precipitation is estimated to be about 21.5 inches for the period of 1925 to 1998, and about 21.05 inches for the period of 1925 to 2004 (noting the missing data late in the latter record). These values are significantly less than that shown on DWR's mean annual precipitation map, which indicates that mean annual precipitation is between 30 and 40 inches in the vicinity of the Gem Lake precipitation station. The protected location of SCE's Gem Lake gage may underestimate precipitation (assuming that the DWR values are the more accurate of the two).

- Figure 1 shows that annual precipitation follows multi-year trends of above-average and below-average precipitation. Notable trend periods are summarized below for the 1925 to 2004 period of record:

Period	**Mean Annual Precipitation**	**Average Annual Departure from Long Term Mean**	
	(in)	(in)	(%)
1925 to 2004*	21.05	-	-
1925 to 1945	25.73	+4.68	+22
1946 to 1961	16.22	-4.83	-23
1961 to 1977	19.81	-1.24	-6
1978 to 1986	27.65	+6.60	+31
1987 to 2004*	17.70	-3.35	-16
1999 to 2004*	15.4	-5.65	-27
1952-1978**	18.81	-2.24	-11

*Data missing for some months in 1999, 2002, and 2003.
** Base period for DWR's 1981 Water Resources Assessment Study.

Based on the foregoing, annual precipitation during the period of 1987 to 2004 has been only about 84 percent of the long-term average.

[17] A precipitation gage located at Ellery Lake, also operated by SCE, shows trends similar to that for Gem Lake. Water year precipitation for the Gem Lake gage also tracks well with LADWP reckonings of runoff year types as set forth in Table L of the 1996 Grant Lake Operation Management Plan.

3.3 Evaporation from Lake Surfaces

DWR Bulletin 73-79, *Evaporation from Water Surfaces in California*, provides monthly pan evaporation data for Grant Lake for the period of 1941 to 1969 (29-year period of record). The average monthly pan evaporation (in inches) for this station is reported to be as follows:

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Tot
Pan Evap (in)	5.2	3.1	3.8	No data, evap presumed to be 0			4.8	6.1	7.0	8.5	8.6	7.0	54.1

According to Bulletin 73-79 a floating pan was used for data collection, however, there is no indication of an appropriate pan factor to apply to the data. In its 1981 Assessment Study, DWR used an annual lake evaporation value of 38 inches for June Lake, and made reference to the Grant Lake evaporation pan. It appears that DWR used an annual pan factor of 0.7, which we have adopted for this study.

4.0 STREAMFLOW CONDITIONS

Streamflow in the region is characterized by relatively high flows occurring in late spring and early summer due to melting snow, and relatively low flows occurring in the early fall to early spring period due low precipitation in the fall, and freezing conditions in the winter and early spring. Long-term records of streamflow are available for Rush Creek at several stations above Grant Lake. Limited streamflow records are available for Reversed Creek and tributaries thereto.

4.1 Rush Creek Flows

The USGS collected streamflow data for the gaging station Rush Creek Above Grant Lake (#10287400) for the period of Water Years 1937 to 1980. LADWP presently operates a gaging station at this site, and data is available from LADWP for the period of 1981 to March 2005. For information, monthly gaged Rush Creek flows are presented in Appendix B. Rush Creek flows at the gage location are impaired due to SCE's power generation operations at its Gem Lake and Agnew Lake facilities. While power operations are largely nonconsumptive on an annual basis, they have a profound affect on monthly flows at the gage site.[18] Accordingly, while the Rush Creek gage has a long period of record, it cannot be relied upon directly as an index for estimating daily and monthly unimpaired flows in tributary watersheds.

Historical and current streamflow data is also reported by the USGS for several stations on Rush Creek above the confluence with Reversed Creek associated with SCE power generation operations. An evaluation of this data for 2004-05 did not indicate a correlation with Fern Creek flow data collected by JLPUD. A description of the

[18] Figure 11 in the Grant Lake Operation Management Plan, Los Angeles Department of Water & Power, February 29, 1996.

methodology and results of the correlation study are provided in Appendix D of this report.

4.2 Reversed Creek Watershed Flows

Watersheds of interest in the Reversed Creek watershed are delineated on Plate III. Flow records for the Reversed Creek watershed are limited and sporadic. As shown in Table 4-1, flow measurements were reported by DWR in its 1981 Assessment Study for two dates in the summer of 1978 at three locations in the watershed. JLPUD has direct flow measurements for one location for a single date in October 1984.

DWR reported semi-continuous flow records for Reversed Creek at the Gull Lake outlet for portions of calendar years 1977 to 1979; these records are shown in Table 4-2. None of the data is complete on a water year basis (Water Year 1979 is the closest to a complete record (November through September) with an average daily flow of about 0.97 cfs). The average flow for Reversed Creek below the Gull Lake outlet was reported to be 1.39 cfs over a 3-year period from November 1984 to November 1987.[19]

5.0 WATER AVAILABLE FROM VILLAGE SYSTEM SOURCES

As presently conceived, the Rodeo Grounds project would obtain its water supply from JLPUD’s Village System, meaning that increased diversions would be made from either Snow Creek or June Lake, or both. The presumption made herein is that future demands would be met first from Snow Creek, and then from June Lake. Reliance on Snow Creek would minimize the amount of water that must be pumped for distribution, and would also minimize potential impacts to June Lake levels.

5.1 Snow Creek Flows

5.1.1 Historical Flow Measurements

There are very few records of Snow Creek flows available.[20] Table 4-1 shows three direct flow measurements for Snow Creek made in 1978 and 1984. These few measurements were made in the summer and fall following above-normal precipitation during the preceding wet seasons. Accordingly, these measurements are not representative of low-flow conditions for a dry-year scenario.

As also shown in Table 4-1, the 2002 June Lake Master Environmental Assessment (MEA) provides a summary of a portion of the historical JLPUD monitoring data for Snow Creek for the period of November 1984 to November 1987. Flows ranged from 0.48 cfs in September 1987 to 2.14 cfs in May 1986. The MEA does not indicate

[19] Mono County Planning Department, June Lake Master Environmental Assessment, 2002.

[20] JLPUD tracked Snow Creek flows at its diversion facility for about six years from 1984 to 1990. According to Mindy Pohlman, those records cannot be found.

whether these are daily or monthly values. The value for May 1986 may be understated due to limitations of the measuring equipment used.

5.1.2 Fern Creek Flows

Since September 2004, JLPUD has operated a Cipolletti weir and stage recorder at its Fern Creek diversion facility capable of measuring bypassed flows up to about 0.75 MGD (about 1.16 cfs). The estimated total flow of Fern Creek can be computed by adding the measured bypassed flows to daily production (i.e. diversions) as metered at the Clark Water Treatment Plant. Per Table 3-1, Water Year 2004 (ending in September 2004) was a very dry year (33 percent of average), and followed a below-average water year in 2003. Accordingly, Fern Creek flows during the ensuing winter of 2004-05 likely represent *base flows* following a dry supply period.

Based on analysis of JLPUD records, Fern Creek bypass flows were within the accuracy range of the Cipolletti weir from September 4, 2004 to mid May 2005. On May 4, 2005, a gate controlling an unmeasured parallel bypass pipeline was opened, therefore measured bypass flows after this date are not accurate and are understated. Bypass flows were also sporadically within the accuracy range of the Cipolletti weir from August 21, 2005 (when the gate on the parallel bypass pipe was closed) to at least September 28, 2005 (the latest date for data provided by JLPUD).

JLPUD staff has recorded staff gage and totalizer readings on an approximate weekly basis since September 2004, subject to access conditions. Estimated daily bypass flows for Fern Creek are shown on Figure 2. Daily flows for days between totalizer observations were estimated by prorating the accumulated flow between readings over the number of days between readings. Bypass flows between May 4 and August 21, 2005, are also shown on Figure 2, but are not accurate because they do not account for flows diverted through the unmeasured parallel bypass conduit. The subject period of accuracy includes the typical low-flow period for the region, associated with diminishing flows in the dry late summer/early fall, and freezing conditions in winter to early spring.

Figure 3 shows daily production for the Clark Water Treatment plant based on JLPUD records. The sum of bypassed flows and daily production provides an estimate of the total unimpaired daily flow of Fern Creek for the period of September 4, 2004 to September 28, 2005. Estimated unimpaired flows are shown graphically in Figure 4. In general, Fern Creek flows declined from around 0.5 MGD (0.77 cfs) in mid-October 2004, to about 0.1 MGD (0.16 cfs) in late March 2005. Flows increased substantially in April 2005, likely as a result of melting snow. Day-to-day fluctuations of as much as 40 percent in the estimated Fern Creek flow during the low-flow period suggest that either 1) the methodology used does not accurately model day-to-day flows, or 2) the flow of Fern Creek cycles naturally, perhaps in response to freeze-thaw conditions. This daily variance in estimated flow is not observed in the August and September 2005 data to the same degree as the earlier data.

5.1.3 Correlation of Snow Creek with Fern Creek

The Snow Creek and Fern Creek watersheds are both situated in the mountainous area south of Reversed Creek. The Fern Creek watershed above the JLPUD diversion facility encompasses an area of about 1,312 acres, which is about 3.3 times larger than the watershed of Snow Creek above the JLPUD diversion (about 410 acres). The watersheds are situated about 1 to 2 miles apart and are similar geologically. Soils also appear to be similar between the two watersheds. The two watersheds differ somewhat in terms of topography and ground cover. The Fern Creek watershed contains a greater percentage of steeper slopes, and relatively fewer forested lands than the Snow Creek watershed.

A rough reckoning of flows in Snow Creek and Fern Creek was made for October 4, 2005, based on observations by Mindy Pohlman and treatment plant production records, as follows:

<u>Fern Creek:</u>

Fern Creek staff gage = 0.36, equates to a bypass flow of <u>0.73 cfs</u>

Possible Clark Plant diversion rate = 135 gpm = 0.30 cfs

Total potential unimpaired Fern Creek flow = 0.73 + 0.30 = <u>1.03 cfs</u>

<u>Snow Creek:</u>[21]

Overflow depth = 1-3/8" through 48-inch wide rectangular opening;
using the rectangular weir equation ($Q = CLH^{3/2}$), with C= 2.8,
bypass flow = <u>0.44 cfs.</u>

Possible Snow Creek Plant diversion rate = 200 gpm = 0.45 cfs

Total potential unimpaired Snow Creek flow = 0.44 + 0.45 = <u>0.89 cfs</u>

It is unknown whether the two plants were diverting water at the time the staff gage and overflow observations were made. These plants cycle on and off according to treated water storage tank levels. The most conservative approach for purposes of estimating unimpaired flows in Snow Creek would be to assume the total potential unimpaired flow for Fern Creek (1.03 cfs) and only the bypass flow at the Snow Creek diversion (0.44 cfs).[22] The resulting ratio of Snow Creek to Fern Creek is about 0.427. This value is

[21] There was no measuring weir in place for Snow Creek in October 2005. The calculation shown is based on the assumption that the overflow configuration of the diversion box at Snow Creek approximates the flow characteristics of a rectangular weir.

[22] This assumes that diversions were being made at Fern Creek when the staff gage was observed, and diversion was not occurring at Snow Creek when the overflow measurement was made.

somewhat close to the drainage area ratio between the two watersheds, which is about 0.306.

Assuming the flow ratio of 0.427 holds for the entire low-flow season, the daily flow at Snow Creek for early September 2004 through early May 2005 can be approximated by multiplying the daily Fern Creek flows in Figure 4 by a factor of 0.427. Figure 5 shows estimated Snow Creek flows for the period of September 4, 2004 to May 4, 2005, based on this factor. Estimated average daily Snow Creek flows for these months are as follows:

		2004				**2005****				
	Units	**Sep**	**Oct**	**Nov**	**Dec***	**Jan**	**Feb**	**Mar**	**Apr**	**Sep**
Est. Daily Flow	MGD	0.14	0.16	0.17	0.16	0.14	0.11	0.08	0.15	0.30
	cfs	0.22	0.26	0.27	0.24	0.21	0.16	0.13	0.24	0.46

* December flows assumed to be average of November and January flows.
** Flows from early May through late August 2005 cannot be estimated due to lack of data.

5.1.4 Sufficiency of Snow Creek Flows to Meet Future Village System Demands

Table 5-1 shows historical and projected average day demands for the Village System for various operational conditions. Table 5-1 also shows the estimated average daily flow for Snow Creek for September 2004 through April 2005 computed in Section 5.1.3 of this Technical Memorandum (September 2005 is also included in Table 5-1). For each condition, the estimated monthly deficit in supply is shown. The following summarizes the water supply available from Snow Creek to meet average day demands for September through April, based on estimated Snow Creek flows following a water year similar to 2004:

<u>Existing - 1990-2003 Average Demand</u> – Snow Creek supply was insufficient to meet average demand in September 2004, and February and March 2005. The deficit ranges from about 0.01 cfs (6,500 gpd) to about 0.08 cfs (about 51,700 gpd). It is noted that actual conditions contradict these results for September 2004. Mindy Pohlman reported that Snow Creek flows were adequate to meet the demand in that particular month, and have always been adequate to meet September demands during her tenure with the JLPUD.[23] As shown on Table 5-2 Snow Creek flows were adequate to meet average demand in September 2005.

<u>Existing Plus Incremental Build-out Only (without Rodeo Grounds)</u> – Snow Creek supply is sufficient for November only. Deficits in other months range from 0.03 to 0.29 cfs (19,400 to 187,400 gpd).

[23] Personal conversation with Mindy Pohlman, November 30, 2005.

Existing Plus Rodeo Grounds Only (excluding incremental Village build-out) - Snow Creek supply is insufficient for all months except November. Deficits range from 0.03 to 0.25 cfs (19,400 to 161,600 gpd).

Total Build-out (existing plus incremental plus Rodeo Grounds) - Snow Creek supply is insufficient for all months. Deficits range from 0.20 cfs (129,300 gpd) to 0.76 cfs (491,200 gpd)

The foregoing suggests that from September through April, in a year following a low precipitation period like 2003-04, Snow Creek is inadequate to fully meet existing demands of the Village system, and would be inadequate to fully meet the estimated demand associated with build-out in the Village service area or development of the Rodeo Grounds project. To the extent that Snow Creek flows would be inadequate to meet demands, diversions from other sources would be required. The other potential existing Village System source is June Lake.

5.2 June Lake

June Lake is a naturally occurring lake located within the eastern extremity of the Reversed Creek watershed. DWR determined that at full pool June Lake has a capacity of about 17,800 acre-feet and a surface area of about 298 acres (see Appendix C). As shown on Plate III, the tributary drainage area of June Lake, inclusive of the lake surface, is about 1,655 acres. The drainage area exclusive of the lake surface is about 1,357 acres. June Lake is tributary to Gull Lake, however, spills from June Lake to Gull Lake have not occurred since 1983. When spills do occur they are conveyed by a culvert under Knoll Avenue at the south end of June Lake, and thence by a densely vegetated channel that passes through a residential area southerly to Gull Lake. Overflows from Gull Lake accrue to Reversed Creek.

JLPUD has historically diverted water from June Lake to serve the Village System. The June Lake source supplements diversions from Snow Creek during certain times of the year, depending upon demand and turbidity conditions at the Snow Creek source. Annual diversions from June Lake for the period of 1990 to 2003 are included in Table 2-1. JLPUD monthly diversions from June Lake for 2004 and a portion of 2005 are provided in Table 2-2.

5.2.1 June Lake Water Balance

The water balance calculation involves comparing the change in June Lake level to the difference in "inflow" to and "outflow" from the Lake over time.[24] The water balance calculation provides an estimate of the "yield" from the June Lake source. In the case of June Lake, yield can generally be conceived of as the amount of water that can be withdrawn during an extended period of low replenishment without negatively affecting

[24] In this Technical Memorandum "inflow" and "outflow" refer to water contributions and losses from June Lake from a number of sources both natural and man-made.

the beneficial uses of the Lake. The terms "negatively affecting" and "beneficial uses" are relative and site-specific. Many municipal reservoirs are operated with significant drawdowns during a drought period, with confidence that the reservoir will be completely replenished in an ensuing normal or wet year. However, June Lake has a relatively small tributary watershed area, and inflow and outflow appear to be approximately in balance under average hydrologic conditions (as hereinafter discussed). Under extended periods of below average precipitation, however, it appears that outflow exceeds inflow.

Excessive drawdowns of the level of Juke Lake could detract from the Lake's aesthetic appeal and its capability to support summer recreation. To our knowledge, however, a criterion for what constitutes a significant or unacceptable drawdown of June Lake has not been advanced, and that is only one of several important parameters that have not been defined for a definitive determination of yield. Speaking generally about the June Lake area, DWR concluded in its 1981 Assessment Study that there was insufficient hydrologic information available for completing a hydrologic balance. The Study recommended that "time-sequenced data should be obtained to allow for a complete dynamic hydrologic balance." There has been a minimal amount of hydrologic data collected since the 1981 Assessment Study, therefore, conclusions based on current conditions, and predications of future effects due to potential increases in diversions, can only be generally assessed at this time.

The following sections discuss Lake level fluctuations, inflow, and outflow, to the extent that individual components of these parameters can be quantified.

5.2.2 Fluctuations in June Lake Level

There is only minimal information available regarding historic June Lake levels, and much of what is available is anecdotal in nature. Mr. John Fredrickson has operated the June Lake Marina and observed June Lake for about the past 35 years.[25] He reported the following observations:

- In the late 1960s to 1970s the Lake level typically fluctuated within a foot of overflow, and water commonly flowed out through the overflow channel.

- In 1977 the lake dropped sufficiently to allow reconstruction of some of the Marina facilities that was precluded at higher lake levels.

- Spills from June Lake last occurred in 1982 to 1983 (an account corroborated by Mindy Pohlman). Flooding occurred at the Marina in that year.

- June Lake dropped sufficiently in 1994 to allow the construction of a 3-foot high breakwater at the Marina.

[25] Personal communication, September 12, 2005.

- The range of fluctuations began to increase about 6 or 7 years ago, and that as of mid-September 2005, the Lake was 3 feet below its normal level.

June Lake was also observed by Wes Johnson, a former Game Warden for the Department of Fish & Game, from 1954 to 1992. While Mr. Johnson could not recall details in Lake level fluctuations, he indicated that there was a control structure at the outflow channel (which often became obstructed by vegetation), and seasonal spills occurred.

Until recently, there had been very few "official" reckonings of the level of June Lake. In its 1981 Assessment Study, DWR reported the Lake level to be at Elevation 7,610.8 on September 14, 1977. The 1992 provisional USGS 7.5-minute quadrangle map shows the Lake to be at Elevation 7,621 based on aerial imagery from 1982.[26] The 10-foot difference in level appears excessive in light of anecdotal accounts. DWR did not identify the vertical datum used for its 1977 measurement, therefore, the difference could be due in part to the use of differing elevation reference points by the two agencies.[27] However, considering that the DWR elevation was made at the end of a severe 2-year drought in California, while the USGS elevation is based on aerial photography taken 5 years later, 4 of which had above-average precipitation, the possibility of this relatively extreme change in elevation should not be discounted outright.

The JLPUD has been tracking June Lake water levels since May 2004 at its intake to the June Lake Water Treatment Plant. JLPUD measurements of Lake level are shown on Table 5-3. JLPUD's measurements are relative and are not tied to DWR or USGS data. Figure 6 shows the level of June Lake from early May 2004 through September 2005. The range in Lake level fluctuations from season to season is summarized below:

Period		**Change in Lake Level**
From	**To**	**(in)**
5/12/04	9/20/04	-15.6
9/20/04	12/27/04	+0.9
12/27/04	6/1/05	+32.7
6/1/05	9/30/05	-17.3

Without knowing whether the Lake was at its high point in mid-May 2004 (when JLPUD began tracking lake levels), it is uncertain whether the 15.6-inch drop in lake level from May to September 2004 represents the total drop during that year. Similarly, it is unknown whether the 17.3-inch drop from June to September 2005 will be the maximum drop for 2005. In any event, the recent seasonal drops in Lake level and the 33-inch rise from late December 2004 to June 2005 support Mr. Fredrickson's anecdotal account that fluctuations in recent years have exceeded 12 inches.

[26] The final USGS 7.5-minute quadrangle for June Lake dated 1994 omits the Lake elevation, although the same aerial imagery as that used for the 1982 provisional edition of this map is still referenced.

[27] Both Mr. Fredrickson and Mr. Johnson doubt that a 10-foot difference occurred during this period.

5.2.3 Inflow to June Lake

Inflow to June Lake comes from two and possibly three sources: direct precipitation on the Lake surface, runoff of precipitation from the drainage area tributary to the Lake, and subsurface inflow due to deep percolation of precipitation in the watershed area tributary to June Lake or subterranean sources outside of the Lake's watershed.

5.2.3.1 Direct Precipitation

In its 1981 Assessment Study, DWR estimated that the mean annual precipitation at June Lake proper was about 20 inches per year. Over the approximate 300-acre surface area of the Lake, this results in an average inflow due to direct precipitation of about 500 acre-feet annually.

5.2.3.2 Watershed Runoff

The watershed area tributary to June Lake is about 1,357 acres. Inflow from the watershed is not measured, and DWR did not quantify watershed runoff in its 1981 Assessment Study. However, a rough estimate of watershed runoff can be made by considering Gull Lake outflows. With reference to Table 4-2 of this report, outflow from Gull Lake was measured to be about 668 acre-feet for the 12-month period from November 1978 to October 1979. The tributary drainage area above Gull Lake, excluding the June Lake watershed, is about 1,666 acres. The unit runoff for this 12-month period (approximate Water Year 1979) was therefore about 0.4 feet per acre. Per Section 2.4.2 the soils in the watersheds of both lakes are similar with respect to hydrologic characteristics. If this same unit runoff value were applicable to the June Lake watershed, the estimated inflow to June Lake in 1979 would have been about 543 acre-feet. LADWP classified 1979 as normal spring runoff year, therefore this value likely represents a good approximation of watershed runoff in a normal water year.

5.2.3.3 Subsurface Inflow

The existence and extent of subsurface inflow to June Lake is unknown. In its 1981 Assessment Study, DWR speculated as to possibility of a subsurface spring source to the Lake, but stated that a "detailed geologic and hydrologic study would be required to substantiate this hypothesis." No such study has been conducted.

5.2.3.4 Inflow Summary

Based on the foregoing, the estimated inflow to June Lake in an average year, excluding any subterranean sources, would be the sum of direct precipitation (500 acre-feet) and watershed runoff (543 acre-feet), or about 1,043 acre-feet.

5.2.4 Outflow From June Lake

Outflows from June Lake are the result of three and possibly four factors: evaporation from the Lake surface, withdrawals by JLPUD, evapotranspiration (ET) by riparian vegetation around the Lake, and subsurface seepage.

5.2.4.1 Lake Evaporation

Regional lake evaporation was discussed in Section 3.3 of this report, and was estimated to be about 38 inches annually. Over the 298-acre surface area of June Lake at full pool, this results in an average evaporation loss of about 944 acre-feet annually. At a drawdown of 5 feet, average evaporation from the approximate 279-acre surface area of the Lake would be about 884 acre-feet. Assuming the Lake likely operates somewhere between these two levels, it is reasonable to average the two estimates of evaporation, which results in a value of 914 acre-feet.

5.2.4.2 JLPUD Withdrawals

For the period of 1990 to 2003 annual withdrawals from June Lake by JLPUD ranged from a low of 4.9 acre-feet to a high of 38 acre-feet, and averaged about 20 acre-feet (see Table 2-1).[28, 29]

5.2.4.3 Evapotranspiration by Riparian Vegetation

In its 1981 Assessment Study, DWR cited a Mono Basin Water Balance Study that proposed using an annual evapotranspiration (ET) amount of 20 inches for terrain below an elevation of 3,200 meters (about 10,500 feet). June Lake is at an elevation of about 7600.

The perimeter of June Lake is about 16,000 feet long. The volume lost to ET depends upon the width of the riparian zone around the Lake. We did not attempt to quantify riparian area, however, the table below provides estimated ET losses for various assumed riparian zone widths ranging from 5 to 20 feet based on a seasonal value of ET of 20 inches:

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[28] June Lake Public Utility District 2004 Master Water Plan Update, Boyle Engineering, August 2004.

[29] For the period of January to August 2005, JLPUD has withdrawn about 49 acre-feet from June Lake (see Table 2-2), which is significantly greater than the 1990-2003 average annual withdrawal. Mindy Pohlman, General Manager for JLPUD, indicated that JLPUD purposely increased production at its June Lake Water Treatment Plant in 2005 to identify any malfunctions in newly installed filtration equipment while it was still under warranty. Ms. Pohlman expects June Lake withdrawals to return to normal levels in future years.

Riparian Zone Width	Riparian Area	ET of Riparian Vegetation
(ft)	(acres)	(acre-feet)
5	1.8	3.1
10	3.7	6.1
20	7.3	12.2

5.2.4.4 Subsurface Seepage

The extent of subsurface seepage, if any, from June Lake is not known. John Fredrickson of June Lake Marina stated that while wells have not been successful in the June Lake area, groundwater has been observed in excavations for home foundations between June Lake and Gull Lake. During our visit to the region in late August 2005, we observed standing water in the channel between June Lake and Gull Lake, immediately downstream of the culvert under Knoll Road. As it appeared that the channel was higher in elevation than the June Lake water surface on that date, the observed water was presumably the result of sources other than June Lake, likely shallow groundwater discharge.

5.2.4.5 Outflow Summary

Based on the foregoing, the estimated average outflow from June Lake, excluding any subterranean sources, is the sum of lake evaporation (about 914 acre-feet), withdrawals by JLPUD (20 acre-feet), and ET by riparian vegetation (12 acre-feet assuming an average riparian zone width of 20 feet), for a total of about 946 acre-feet.

5.2.5 Discussion of Historic Water Balance

Based on the foregoing, and absent significant subsurface sources of inflow to or outflow from June Lake, the estimated average inflow to the Lake of 1,043 acre-feet is slightly in excess of the estimated average annual outflow from the Lake of 946 acre-feet. The difference in estimated average inflow and outflow of 97 acre-feet translates to a depth of about 3.9 inches over the surface area of the Lake at full pool, i.e., under average water year conditions and at historic JLPUD withdrawals the level of June Lake would theoretically increase by about 3.9 inches per year. However, in recent years precipitation has been much lower than average, and Mr. Fredrickson has indicated that the Lake is at its lowest level in 35 years.

The affect of historic JLPUD diversions from June Lake appears to have a relatively minor affect on the range in Lake level fluctuations. The 1990-2003 average annual diversion of 20 acre-feet by JLPUD represents only about 0.07 feet (less than 1 inch) of depth over the Lake surface area of 298 acres at full pool. The average JLPUD withdrawal for 1999 to 2003 was about 12.7 acre-feet, equivalent to a depth of about 0.04 feet (about 0.5 inch) over the Lake surface.

The drop in Lake levels observed by Mr. Fredrickson over the last 6 to 7 years appears to be driven by climatic trends. Based on the Gem Lake precipitation record, annual precipitation for Water Years 1999-2004 has been over 25 percent less, on average, than the long-term historical mean annual precipitation (see Table 3-1 and Figure 1). Assuming a direct correlation between annual precipitation and inflow to June Lake, a 25 percent reduction in annual inflow to June Lake would have resulted in an average inflow of about 732 acre-feet over 6 years, which is about 163 acre-feet less annually than the estimated average annual outflow. Cumulatively over the 6-year period, the net depletion would be about 978 acre-feet. Based on the capacity curve for June Lake in DWR's 1981 Assessment Study (copy provided in Appendix C of this Technical Memorandum), a depletion of 978 acre-feet results in drawdown in Lake level of about 3 feet. The foregoing calculation demonstrates the sensitivity of June Lake to multi-year climatic trends, and likely explains much of the drop in Lake level observed by Mr. Fredrickson over the last 6 to 7 years.

5.2.6 Affect of Future Withdrawals

Projected monthly average day demands for JLPUD's Village system under various levels of development are provided in Table 5-1. Table 5-1 also shows the estimated low-flow season supply deficits for the Snow Creek source (in acre-feet) following a water year like 2004. If the Snow Creek supply deficits were to be satisfied by diversions from June Lake, the following monthly amounts would be required:

Condition	Required Supply From June Lake (acre-feet)								
	Sep	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Total**
Existing (1990-2003)	4.7	0	0	0	0	0.3	1.7	0	6.7
Existing Plus Incremental Build-out Only	17.1	6.8	0	1.6	3.9	6.9	8.4	4.9	49.6
Existing Plus Rodeo Grounds Only	15.0	4.6	0	1.8	4.7	7.2	8.3	2.5	44.1
Total Build-out	27.5	14.0	3.3	8.6	11.7	13.8	15.0	10.4	104.3

With reference to Table 2-1, JLPUD withdrawals from June Lake averaged about 19.8 acre-feet from 1990 to 2003. During the period from 1999 to 2003 (generally the period corresponding to anecdotal accounts of the Lake level dropping), JLPUD withdrawals from June Lake averaged about 12.7 acre-feet.[30] If the foregoing projected withdrawals from June Lake had occurred during 6-year period of 1999 to 2004, the drawdown in Lake level would have been greater by the difference between the historic withdrawal and the projected withdrawal, as follows:

[30] We have excluded consideration of JLPUD's diversions from June Lake in 2004, because JLPUD began diverting more from June Lake than it typically would due to treatment plant start-up requirements.

Condition	Total Annual Demand on June Lake	Lake Drawdown for 1 year*	Incremental 1-year Lake Drawdown	Incremental Lake Drawdown for 6 Years
	(af)	(ft)	(ft)	(ft)
Existing	12.7	.04	-	-
Exist. Plus Inc. Build-out Only	49.6	0.17	0.13	0.78
Exist. Plus Rodeo Grounds Only	44.1	0.15	0.11	0.66
Total Build-out	104.3	0.35	0.31	1.86

* Based on a Lake surface area of about 298 acres at full pool.

In other words, if only the Rodeo Grounds project existed during the 6-year period the 3-foot-below-normal lake level that Mr. Fredrickson observed would instead be approximately 3 + 0.66 = 3.66 feet below normal. Under Total Build-out conditions the estimated drawdown would be about 3 + 1.86 = 4.86 feet instead of 3 feet.

It cannot be predicted at this level of evaluation whether the recent trend in below normal precipitation will continue in the future. As can be seen in Figure 1, during a 15-year period from 1946 to 1961 annual precipitation was below average in all but two years. It is possible that such a trend could occur again in the future; the region may be in the midst of one now. Presumably, nature balances over time and a wet period is in the offing at some point that would return June Lake to normal levels, however, the "when" is either unknowable or requires a detailed evaluation of long-term climate trends.

5.2.7 Snow Creek Depletion

It should be noted that the foregoing analysis computes the demand deficit that would be met by June Lake diversions after all available flows from Snow Creek have been diverted for water supply. Absent from this reckoning is consideration of any in-stream flow needs in Snow Creek during the low-flow period. To the extent that some amount of flow would remain in Snow Creek downstream of the JLPUD diversion, such as for environmental preservation or in deference to downstream senior water rights, the supply deficit and the draft on June Lake would be greater than that estimated above.

6.0 DOWN CANYON SOURCES

The sources of supply to the Down Canyon System (Fern Creek and the unnamed stream) appear to be unlikely candidates for meeting future supply deficits in the Village System. With reference to Figure 2, estimated bypass flows at Fern Creek during the period of September 2004 to April 2005 were often below the bypass rate of 200 gpm (0.29 MGD) mandated by State water right licenses and permits applicable to this point of diversion. With reference to Figure 3, the required minimum bypass was not being met while diversions were being made. Accordingly, the availability of water from Fern Creek to meet existing demands, let alone projected future demand deficits, is questionable during the low-flow season following a water year like 2004.

As discussed earlier, flows in Fern Creek and Snow Creek appear to be dependent upon watershed area size. The estimated watershed area of the unnamed stream serving the Petersen Water Treatment Plant is by far the smallest of the three (about 163 acres). There have been no streamflow measurements for the unnamed stream, therefore the capability of this source to met future demand deficits, over and above its current demand, cannot be estimated.

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Tables

TABLE 2-1
June Lake Public Utility District
Annual Water Production, 1990 to 2003

Million Gallons (MG)

Year	Down Canyon System			Village System			Total
	Petersen	Clark	Subtotal	June Lake	Snow Creek	Subtotal	
1990	15.2	15.1	30.3	6.1	65.0	71.1	101.4
1991	17.7	20.2	37.9	10.2	59.8	70.0	107.9
1992	20.5	19.8	40.3	8.8	43.1	51.9	92.2
1993	23.8	31.9	55.7	12.4	42.6	55.0	110.7
1994	25.5	42.6	68.1	8.7	44.8	53.5	121.6
1995	23.6	35.9	59.5	8.1	41.7	49.8	109.3
1996	22.7	39.1	61.8	9.5	48.0	57.5	119.3
1997	30.1	33.5	63.6	4.3	48.9	53.2	116.8
1998	26.1	33.1	59.2	1.6	48.6	50.2	109.4
1999	32.2	37.7	69.9	4.0	48.5	52.5	122.4
2000	29.6	50.5	80.1	4.2	49.8	54.0	134.1
2001	36.0	51.0	87.0	2.9	56.1	59.0	146.0
2002	33.5	58.0	91.5	3.8	60.1	63.9	155.4
2003	28.4	47.9	76.3	5.7	49.8	55.5	131.8
Average	**26.1**	**36.9**	**62.9**	**6.5**	**50.5**	**56.9**	**119.9**

Acre-feet (af)

Year	Down Canyon System			Village System			Total
	Petersen	Clark	Subtotal	June Lake	Snow Creek	Subtotal	
1990	46.7	46.3	93.0	18.7	199.5	218.2	311.2
1991	54.3	62.0	116.3	31.3	183.5	214.8	331.2
1992	62.9	60.8	123.7	27.0	132.3	159.3	283.0
1993	73.0	97.9	170.9	38.1	130.7	168.8	339.7
1994	78.3	130.7	209.0	26.7	137.5	164.2	373.2
1995	72.4	110.2	182.6	24.9	128.0	152.8	335.5
1996	69.7	120.0	189.7	29.2	147.3	176.5	366.1
1997	92.4	102.8	195.2	13.2	150.1	163.3	358.5
1998	80.1	101.6	181.7	4.9	149.2	154.1	335.8
1999	98.8	115.7	214.5	12.3	148.9	161.1	375.7
2000	90.8	155.0	245.8	12.9	152.8	165.7	411.6
2001	110.5	156.5	267.0	8.9	172.2	181.1	448.1
2002	102.8	178.0	280.8	11.7	184.5	196.1	476.9
2003	87.2	147.0	234.2	17.5	152.8	170.3	404.5
Average	**80.0**	**113.2**	**193.2**	**19.8**	**154.9**	**174.7**	**367.9**

Source: June Lake Public Utility District 2004 Master Water Plan Update,
Boyle Engineering Corporation, August 2004.

TABLE 2-2
June Lake Public Utility District
Monthly Summary of Water Production

Million Gallons (MG)

Year	Month	SCWTP	JLWTP	Subtotal Village	Clark	Petersen	Subtotal Down Canyon	Total System
2004	January	2.625	0	2.625	1.6794	1.713	3.3924	6.0174
	February	1.909	0	1.909	1.5226	1.511	3.0336	4.9426
	March	2.332	0	2.332	1.4511	1.668	3.1191	5.4511
	April	2.783	0	2.783	2.1386	1.565	3.7036	6.4866
	May	4.047	0.01	4.057	4.4485	3.556	8.0045	12.0615
	June	5.92	0	5.92	4.9301	3.661	8.5911	14.5111
	July	6.124	0	6.124	5.3372	4.022	9.3592	15.4832
	August	5.559	0	5.559	5.4192	4.353	9.7722	15.3312
	September	4.77	0	4.77	4.5637	3.98	8.5437	13.3137
	October	3.319	0	3.319	3.2043	4.065	7.2693	10.5883
	November	0.696	1.99	2.686	2.154	2.978	5.132	7.818
	December	0.485	1	1.485	1.8629	1.461	3.3239	4.8089
Total 2004		**40.569**	**3**	**43.569**	**38.7116**	**34.533**	**73.2446**	**116.8136**
2005	January	0.833	1.47	2.303	1.992	1.633	3.625	5.928
	February	1.661	1.4	3.061	1.8013	1.42	3.2213	6.2823
	March	1.94	0.81	2.75	1.9514	1.419	3.3704	6.1204
	April	2.58	0.66	3.24	1.85	1.518	3.368	6.608
	May	0.44	5.07	5.51	4.129	0.358	4.487	9.997
	June	6.28	2.44	8.72	5.755	1.561	7.316	16.036
	July	9.21	1.83	11.04	5.5658	3.5	9.0658	20.1058
	August	8.36	1.3	9.66	5.4215	3.411	8.8325	18.4925
	September	4.69	1.04	5.73	4.2681	2.413	6.6811	12.4111
Total 2005 (partial)		**35.994**	**16.02**	**52.014**	**32.7341**	**17.233**	**49.9671**	**101.9811**

Acre-feet (af)

Year	Month	SCWTP	JLWTP JL	Subtotal Village	Clark	Petersen	Subtotal Down Canyon	Total System
2004	January	8.06	0.00	8.06	5.15	5.26	10.41	18.47
	February	5.86	0.00	5.86	4.67	4.64	9.31	15.17
	March	7.16	0.00	7.16	4.45	5.12	9.57	16.73
	April	8.54	0.00	8.54	6.56	4.80	11.37	19.91
	May	12.42	0.03	12.45	13.65	10.91	24.57	37.02
	June	18.17	0.00	18.17	15.13	11.24	26.37	44.54
	July	18.80	0.00	18.80	16.38	12.34	28.72	47.52
	August	17.06	0.00	17.06	16.63	13.36	29.99	47.05
	September	14.64	0.00	14.64	14.01	12.22	26.22	40.86
	October	10.19	0.00	10.19	9.83	12.48	22.31	32.50
	November	2.14	6.11	8.24	6.61	9.14	15.75	23.99
	December	1.49	3.07	4.56	5.72	4.48	10.20	14.76
Total 2004		**124.51**	**9.21**	**133.72**	**118.81**	**105.99**	**224.79**	**358.51**
2005	January	2.56	4.51	7.07	6.11	5.01	11.13	18.19
	February	5.10	4.30	9.39	5.53	4.36	9.89	19.28
	March	5.95	2.49	8.44	5.99	4.36	10.34	18.78
	April	7.92	2.03	9.94	5.68	4.66	10.34	20.28
	May	1.35	15.56	16.91	12.67	1.10	13.77	30.68
	June	19.27	7.49	26.76	17.66	4.79	22.45	49.22
	July	28.27	5.62	33.88	17.08	10.74	27.82	61.71
	August	25.66	3.99	29.65	16.64	10.47	27.11	56.76
	September	14.39	3.19	17.59	13.10	7.41	20.50	38.09
Total 2005 (partial)		**110.47**	**49.17**	**159.64**	**100.46**	**52.89**	**153.35**	**312.99**

Source: Mindy Pohlman, General Manager, JLPUD.

TABLE 3-1
Gem Lake Monthly Precipitation,
Water Years 1925 to 2004[1]

Water Year	Monthly Precipitation (inches)												Annual Total
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1925	1.89	3.50	4.34	1.86	5.38	2.36	2.90	0.41	0.73	1.26	0.00	0.00	**24.6**
1926	2.29	1.02	1.12	5.90	9.15	0.91	4.08	0.77	1.26	1.93	0.00	0.00	**28.4**
1927	0.89	5.64	5.78	2.74	5.41	3.46	4.32	0.17	1.45	0.66	0.00	0.77	**31.3**
1928	2.87	2.87	4.11	3.03	3.10	4.32	3.31	1.62	0.26	0.34	0.00	0.00	**25.8**
1929	1.45	1.56	2.63	3.01	2.65	5.02	2.10	0.80	0.42	0.00	0.62	0.29	**20.6**
1930	0.07	0.00	2.87	6.83	2.79	4.80	2.81	2.16	0.00	0.00	0.20	0.33	**22.9**
1931	1.25	1.31	0.07	5.43	2.15	1.85	2.45	0.75	1.45	0.00	2.10	0.63	**19.4**
1932	0.97	4.94	5.91	3.43	7.26	0.75	0.62	0.96	1.10	0.00	0.00	1.23	**27.2**
1933	0.38	0.43	1.97	6.31	0.95	2.79	0.30	2.29	0.96	0.00	0.31	0.00	**16.7**
1934	1.31	0.47	5.17	1.53	3.42	0.91	0.00	0.64	1.49	0.00	1.21	0.81	**17.0**
1935	1.62	2.37	2.03	7.48	2.56	3.62	5.79	0.14	0.00	0.33	2.25	0.03	**28.2**
1936	1.01	1.05	3.31	3.13	9.23	1.56	1.64	0.28	0.94	2.36	0.57	0.04	**25.1**
1937	2.26	0.00	8.03	3.92	6.94	2.43	0.67	0.00	0.00	0.47	0.00	0.00	**24.7**
1938	0.25	1.11	4.67	2.23	10.28	8.51	1.45	2.26	1.08	0.85	0.21	1.27	**34.2**
1939	1.57	0.68	1.62	3.23	2.91	2.84	0.99	0.64	0.35	0.59	0.32	1.63	**17.4**
1940	2.32	0.37	0.45	13.18	8.28	2.72	0.96	0.00	0.30	0.00	0.06	0.45	**29.1**
1941	1.51	0.61	12.77	6.58	6.84	3.52	3.63	0.30	0.41	0.00	0.73	0.78	**37.7**
1942	3.34	0.51	8.62	3.05	3.87	3.85	3.72	2.16	0.00	0.00	0.38	0.27	**29.8**
1943	0.38	2.30	3.82	10.11	1.78	4.55	3.48	0.76	1.00	0.38	0.00	0.16	**28.7**
1944	0.63	0.76	4.76	5.91	6.61	2.12	2.03	0.57	0.11	0.00	0.00	0.03	**23.5**
1945	0.11	5.87	3.32	1.38	7.66	3.62	1.24	1.06	0.36	0.26	2.62	0.53	**28.0**
1946	5.22	2.71	4.91	0.59	1.82	3.20	0.66	0.72	0.00	0.00	0.42	0.37	**20.6**
1947	2.46	6.42	4.00	0.14	0.97	0.62	0.86	0.17	0.00	0.00	0.36	0.12	**16.1**
1948	1.50	0.40	0.68	1.57	1.50	2.33	3.45	0.29	1.30	0.00	0.00	0.03	**13.1**
1949	0.35	0.12	4.31	1.20	1.56	4.06	0.19	1.41	0.12	0.02	0.24	0.06	**13.6**
1950	0.20	1.27	0.91	3.13	1.90	1.64	1.82	0.44	0.03	1.22	0.09	1.09	**13.7**
1951	2.96	7.11	3.85	1.54	0.29	0.28	1.77	0.75	0.47	0.98	0.52	0.00	**20.5**
1952	0.91	4.10	7.10	6.80	1.30	6.10	0.80	0.50	0.20	0.30	0.00	0.90	**29.0**
1953	0.10	1.28	3.71	2.15	0.19	0.92	0.86	1.96	0.69	1.56	0.19	0.15	**13.8**

Water Year	Monthly Precipitation (inches)												Annual Total
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1954	0.65	1.02	0.38	2.68	2.69	3.32	0.19	0.11	0.59	0.77	0.00	0.00	**12.4**
1955	0.00	1.46	3.69	2.96	1.36	0.68	2.21	1.21	0.02	0.11	0.10	0.07	**13.9**
1956	0.13	2.04	9.91	3.11	1.02	0.14	2.60	1.52	0.13	2.67	0.00	0.65	**23.9**
1957	1.33	0.00	0.50	3.00	2.70	1.30	0.70	1.65	0.08	0.00	0.00	0.20	**11.5**
1958	1.12	0.60	2.52	1.80	3.98	2.75	1.48	0.86	0.46	0.08	1.45	0.40	**17.5**
1959	0.26	0.40	0.60	2.28	6.02	0.50	0.90	0.58	0.08	0.16	0.00	2.30	**14.1**
1960	0.04	0.00	0.62	3.02	2.72	1.35	0.78	0.24	0.00	1.22	0.06	0.38	**10.4**
1961	1.02	4.18	1.82	0.50	1.24	1.62	1.10	0.78	0.30	0.26	1.44	1.18	**15.4**
1962	0.78	2.28	1.22	1.64	8.80	2.36	0.12	0.94	0.56	0.56	0.40	0.75	**20.4**
1963	0.95	0.44	0.85	5.55	1.20	3.46	3.85	2.00	1.80	0.00	0.34	1.58	**22.0**
1964	0.75	3.52	0.50	2.58	0.30	1.95	1.89	1.63	1.00	0.73	1.07	0.00	**15.9**
1965	0.66	3.95	7.96	4.59	1.05	0.80	1.56	0.56	0.76	0.90	2.20	0.50	**25.5**
1966	0.25	11.10	3.58	0.90	1.28	0.60	0.45	0.22	0.20	0.28	1.94	0.46	**21.3**
1967	0.08	3.74	4.16	4.80	0.58	7.00	5.36	0.98	0.18	0.98	0.88	1.48	**30.2**
1968	0.44	3.10	0.88	1.38	1.48	1.34	0.48	1.04	0.38	1.36	0.34	0.02	**12.2**
1969	0.98	1.72	4.72	14.57	6.98	0.70	1.10	0.38	0.98	0.52	0.28	0.00	**32.9**
1970	1.46	0.74	1.86	4.98	1.24	1.68	0.60	0.00	0.24	0.22	0.00	0.00	**13.0**
1971	0.22	5.66	4.96	2.60	0.32	1.22	0.60	2.00	0.24	0.52	1.62	0.54	**20.5**
1972	0.18	2.52	7.92	0.68	0.44	0.00	1.72	0.46	1.08	0.40	0.00	1.96	**17.4**
1973	1.52	2.86	1.82	3.26	6.10	1.98	0.52	0.50	0.12	0.06	1.06	0.02	**19.8**
1974	1.68	4.36	2.38	3.16	0.64	3.98	1.22	0.24	0.00	2.48	0.50	0.00	**20.6**
1975	0.92	0.80	3.21	0.99	4.76	3.76	2.98	0.42	0.42	0.36	0.48	1.94	**21.0**
1976	3.08	0.68	0.28	0.52	1.89	1.42	1.38	0.16	0.00	2.72	0.66	2.16	**15.0**
1977	0.40	0.22	0.16	1.68	1.32	1.03	0.28	1.58	1.86	0.20	0.28	0.12	**9.1**
1978	0.42	1.98	5.14	5.42	5.31	3.76	2.96	0.24	0.44	0.16	0.38	2.74	**29.0**
1979	0.16	1.98	2.22	4.90	2.74	4.28	0.80	0.48	0.06	0.26	0.34	0.14	**18.4**
1980	0.65	1.20	3.74	5.70	5.05	2.68	1.68	1.50	0.56	0.56	0.18	0.40	**23.9**
1981	5.59	1.81	4.02	4.10	1.14	3.06	0.48	0.56	0.30	0.30	0.10	0.36	**21.8**
1982	2.36	3.70	4.42	6.36	1.10	6.64	9.12	0.20	2.08	0.36	1.78	3.26	**41.4**
1983	3.06	5.18	7.58	4.22	5.64	8.80	2.15	0.78	0.28	0.00	2.04	0.88	**40.6**
1984	0.98	6.02	9.02	0.58	1.36	1.24	1.55	0.48	0.44	0.94	1.70	0.58	**24.9**
1985	2.00	4.16	1.66	0.58	1.90	4.94	0.42	0.14	0.50	0.54	0.00	2.38	**19.2**
1986	1.32	4.02	3.40	3.22	12.12	4.50	0.60	0.18	0.00	0.10	0.02	0.26	**29.7**
1987	0.24	0.06	0.48	2.64	1.42	2.00	0.52	1.26	0.46	0.10	0.02	0.00	**9.2**

Water Year	Monthly Precipitation (inches)												Annual Total
	Oct	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	
1988	1.16	2.22	3.00	3.18	0.60	0.32	1.18	0.56	0.62	0.92	0.82	0.56	**15.1**
1989	0.00	2.60	2.56	1.20	2.20	6.34	1.14	1.98	0.82	0.00	1.34	2.06	**22.2**
1990	1.48	1.00	0.16	5.16	2.41	0.58	0.68	0.51	0.62	1.28	0.86	0.70	**15.4**
1991	0.16	0.40	0.76	0.72	0.47	12.15	0.08	0.44	0.31	0.38	0.00	0.72	**16.6**
1992	0.88	0.99	2.50	0.10	4.66	2.10	0.12	0.51	0.42	0.92	1.92	0.18	**15.3**
1993	1.68	0.05	5.79	8.27	6.01	1.78	0.69	0.37	0.43	0.00	0.04	0.05	**25.2**
1994	0.41	1.01	0.86	0.67	3.19	1.09	0.46	1.63	0.07	0.21	0.00	1.15	**10.8**
1995	2.35	3.10	1.81	11.50	0.49	8.51	0.80	1.80	0.85	0.75	0.18	0.00	**32.1**
1996	0.00	0.07	2.97	3.80	5.49	2.85	1.45	2.17	0.15	0.58	0.00	0.08	**19.6**
1997	1.37	4.66	6.76	5.77	0.37	0.19	0.12	0.10	0.94	0.65	0.00	0.44	**21.4**
1998	0.57	2.03	2.17	2.25	8.03	2.28	0.83	1.01	0.87	0.12	1.33	1.75	**23.2**
1999	0.51	2.02	0.17	3.33	3.00	1.20	--	--	--	--	0.59	0.65	**11.5**
2000	0.40	1.00	0.10	3.34	4.26	0.71	1.95	0.27	0.47	0.00	0.96	0.00	**13.5**
2001	2.66	0.75	0.00	4.70	6.11	6.07	4.61	0.50	0.10	1.69	0.96	1.25	**29.4**
2002	1.08	3.37	5.33	2.65	1.30	1.18	1.62	0.66	0.36	0.42	0.17	--	**18.1**
2003	--	2.92	4.39	0.74	2.21	1.82	--	--	0.10	--	0.88	--	**13.1**
2004	0.00	0.00	0.69	0.00	0.00	0.30	0.80	1.41	0.91	1.01	1.42	0.34	**6.9**
Average	**1.17**	**2.21**	**3.31**	**3.57**	**3.34**	**2.77**	**1.66**	**0.83**	**0.52**	**0.56**	**0.58**	**0.64**	**21.05**

Notes:
[(1)] Data reported by DWR California Data Exchange Center web site for Gem Lake (GLK). Station operated by Southern California Edison.

TABLE 4-1
Historical Measured Flows for Rush Creek, Reversed Creek, and Snow Creek
(all values in units of cfs)

		Reversed Creek			Snow Creek	
Date	Rush Creek Above Grant Lake[1]	Upstream of Rush Creek[2]	Upstream of Snow Creek[2]	At Gull Lake Outlet	Upstream of Reversed Creek[2]	Upstream of JLPUD Diversion
8/17/1978	131	12.5	1.52	0.4 [4]	0.95	-
9/27/1978	106	10.88	1.45	0.56 [4]	0.81	-
10/24/1984	69.4	-	-	0.92 [5]	-	0.95 [3]
7/16/1985	74.1	-	-	<0.35 [6]	-	-
3/11/1986	84.3	-	-	9.62 [6]	-	-
May-86	185	-	-	-	-	2.14 [7]
September-87	40	-	-	-	-	0.48 [7]

Notes:

(1) Per USGS, average day flow for 1978 values. 1984 through 1987 values are average monthly flows per LADWP.

(2) Direct flow measurements per DWR June Lake Area Water Resources Assessment Study, April 1981.

(3) Per JLPUD data sheet, corrected by Wagner & Bonsignore for math error.

(4) Average month flow for 1978 values per DWR Assessment Study.

(5) Direct flow measurement for 1984 value per JLPUD data sheet.

(6) Mono County Planning Department, June Lake Master Environmental Assessment, 2002.

(7) Ibid.; the value for May 1986 is questionable due to limitation of measuring device.

TABLE 4-2
Reversed Creek Monthly Flows at Gull Lake Outlet, Water Years 1977 to 1980

Water Year	Monthly Mean Discharge (af)												Annual Total	Water Year Type (per LADWP)
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
1977	-	-	-	PR	40.0	46.7	42.2	33.8	-	-	-	-	**162.8**	Dry
1978	-	-	-	-	-	-	87.5	PR	43.4	-	24.6	33.3	**188.8**	Wet
1979	-	26.8	28.9	73.2	87.7	173.4	98.8	78.1	32.1	18.4	17.2	8.9	**643.6**	Normal
1980	24.0	33.9	61.5	-	-	-	-	-	-	-	-	-	**119.4**	Wet
Average	**24.0**	**30.3**	**45.2**	**73.2**	**63.9**	**110.1**	**76.2**	**56.0**	**37.8**	**18.4**	**20.9**	**21.1**	**577.0**	

Sources: DWR 1981 June Lake Area Water Resources Assessment Study and LADWP Grant Lake Operation Management Plan, 2/29/96.
PR = partial record
"-" = no report

TABLE 5-1

JLPUD Village System

Sufficiency of Estimated Monthly Flow in Snow Creek to Meet Historical and Projected Average Day Demands, September 2004 through September 2005

		2004				2005								
	Units	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Estimated Monthly Flow in Snow Creek, 2004-2005	cfs	0.22	0.26	0.27	0.24	0.21	0.16	0.13	0.24	-	-	-	-	0.46

		Average Day Demand													
Condition	**Units**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Annual Average**
Existing - 1992-2003 average[1]	gpd	190,808	138,389	91,976	100,460	103,574	108,939	99,317	120,298	167,334	200,318	249,401	255,878	190,808	152,224
	cfs	0.30	0.21	0.14	0.16	0.16	0.17	0.15	0.19	0.26	0.31	0.39	0.40	0.30	0.24
Deficit[4]	cfs	-0.08	0.00	0.00	0.00	0.00	-0.01	-0.03	0.00	-	-	-	-	0.00	-
	af	-4.7	0.0	0.0	0.0	0.0	-0.3	-1.7	0.0	-	-	-	-	0.0	-
Existing Plus Incremental Build-out Only[2]	gpd	326,214	236,596	157,247	171,751	177,075	186,247	169,797	205,667	286,082	342,473	426,388	437,461	326,214	260,250
	cfs	0.50	0.37	0.24	0.27	0.27	0.29	0.26	0.32	0.44	0.53	0.66	0.68	0.50	0.40
Deficit[4]	cfs	-0.29	-0.11	0.00	-0.03	-0.06	-0.12	-0.14	-0.08	-	-	-	-	-0.05	-
	af	-17.1	-6.8	0.0	-1.6	-3.9	-6.9	-8.4	-4.9	-	-	-	-	-2.8	-
Rodeo Grounds (only)[3]	gpd	112,215	75,341	51,909	73,626	82,440	79,999	69,010	59,613	80,977	133,023	146,568	131,048	112,215	91,314
Existing Plus Rodeo Grounds Only	gpd	303,023	213,730	143,885	174,086	186,014	188,938	168,327	179,911	248,311	333,341	395,969	386,926	303,023	243,538
	cfs	0.47	0.33	0.22	0.27	0.29	0.29	0.26	0.28	0.38	0.52	0.61	0.60	0.47	0.38
Deficit[4]	cfs	-0.25	-0.08	0.00	-0.03	-0.08	-0.13	-0.14	-0.04	-	-	-	-	-0.01	-
	af	-15.0	-4.6	0.0	-1.8	-4.7	-7.2	-8.3	-2.5	-	-	-	-	-0.7	-
Total Build-out (Existing + Incremental + Rodeo Grounds)	gpd	438,429	311,937	209,156	245,377	259,515	266,246	238,807	265,280	367,059	475,496	572,956	568,509	438,429	351,564
	cfs	0.68	0.48	0.32	0.38	0.40	0.41	0.37	0.41	0.57	0.74	0.89	0.88	0.68	0.54
Deficit[4]	cfs	-0.46	-0.23	-0.06	-0.14	-0.19	-0.25	-0.24	-0.17	-	-	-	-	-0.22	-
	af	-27.5	-14.0	-3.3	-8.6	-11.7	-13.8	-15.0	-10.4	-	-	-	-	-13.1	-

Notes:

(1) Table 3 in 2004 JLPUD Master Water Plan Update, Boyle Engineering Corporation, August 2004

(2) Annual average value per Table 6 in 2004 JLPUD Master Water Plan Update. Note that monthly values are computed herein by prorating the average annual using the same monthly to annual ratios as for 1992-2003 conditions. The computed maximum month is slightly less than that estimated in the Master Water Plan Update.

(3) Based on Table 5 in Draft Technical Memorandum No. 2, Rodeo Grounds Water Demands, May 23, 2006.

(4) Deficit = Snow Creek flow - Demand.

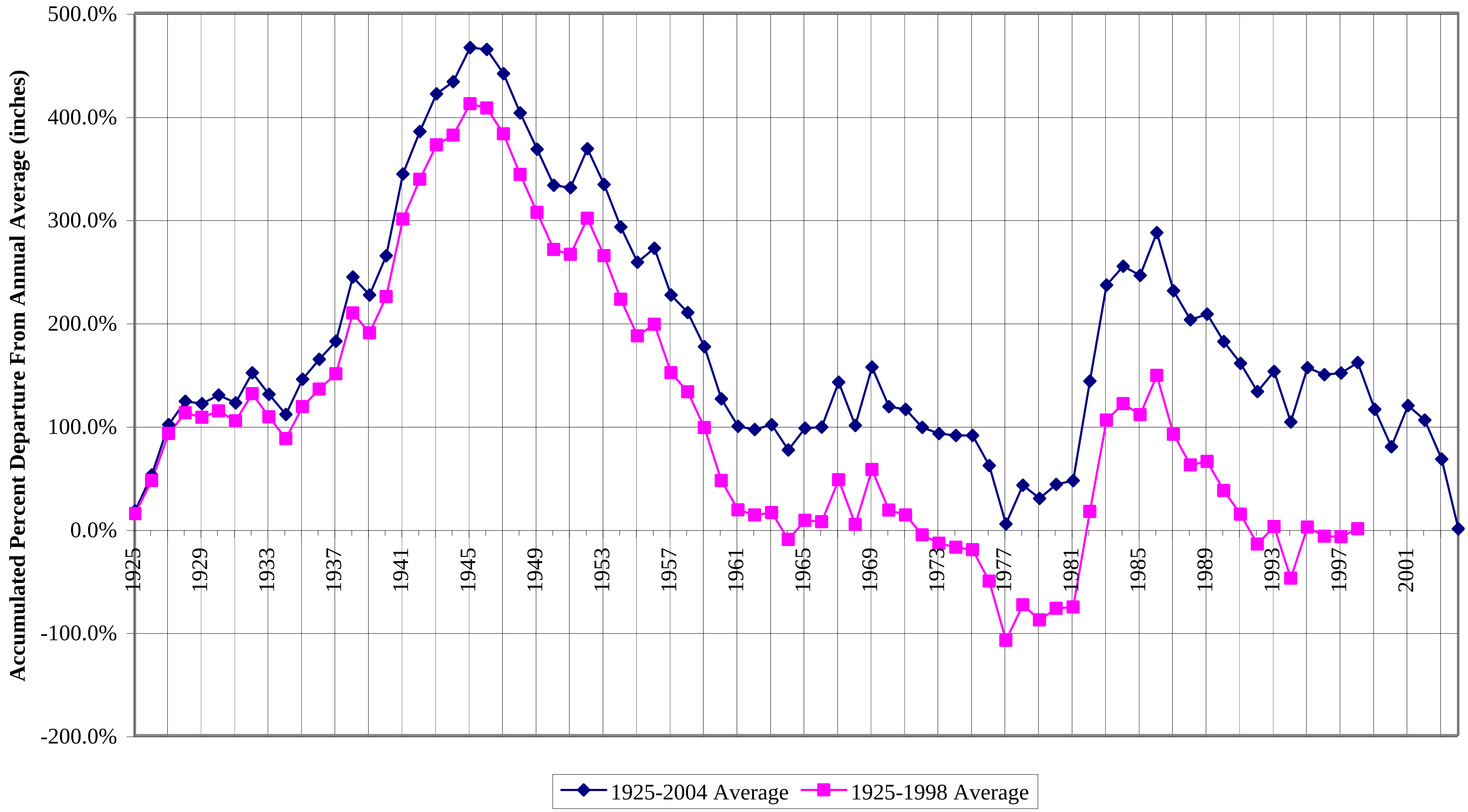
TABLE 5-2
June Lake Public Utilities District
Measured June Lake Water Levels
(daily amounts in inches above bottom of intake column)

April 2004 - March 2005												
Day	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
1	--	--	--	--	--	--	--	--	14.8	19.3	--	32.9
2	--	--	--	--	--	--	--	--	14.8	19.1	27.3	32.9
3	--	--	--	25.4	--	--	--	--	14.8	--	--	--
4	--	--	--	25.4	--	16.2	--	14.5	15	--	27.4	33.2
5	--	--	28.7	--	--	16	--	14.2	15.1	20.5	27.4	--
6	--	--	28.7	25.2	--	--	--	14.2	14.9	--	27.5	--
7	--	--	28.4	25.4	--	15.8	--	14.2	15.2	21.3	27.5	33.4
8	--	--	28.1	25.2	--	15.7	--	15	14.7	--	--	--
9	--	--	27.7	--	--	--	--	--	--	--	27.6	33.5
10	--	--	27.7	24.7	--	15.4	--	--	--	24.8	27.2	33.6
11	--	--	--	24.4	--	15.3	--	15.2	14.7	25.4	27.9	33.7
12	--	29.5	27.4	24.2	--	15.2	--	--	14.8	25.5	28	33.8
13	--	30	27.4	23.9	--	15.2	--	--	14.7	25.6	28.1	33.9
14	--	--	--	23.7	--	15	--	--	14.6	25.6	28.1	34
15	--	--	--	23.5	18.2	14.9	--	--	--	25.7	--	34
16	--	--	27.2	--	18.2	14.8	--	--	--	25.7	29.4	34.1
17	--	--	--	23.4	18.1	14.7	--	14.9	14.6	--	--	--
18	--	--	--	23.4	16.8	14.6	--	--	14.6	--	29.6	34.2
19	--	--	26.9	--	--	14.3	--	--	14.7	25.9	29.7	34.5
20	--	--	26.8	23.1	--	13.9	--	14.9	14.8	25.9	--	35
21	--	--	26.6	22.9	--	--	--	14.9	14.8	26	--	35
22	--	--	--	22.8	--	--	--	--	14.8	26	31.9	35.7
23	--	29.1	--	22.7	--	--	--	--	14.5	26	32.2	36.5
24	--	--	--	22.6	--	--	--	--	14.6	--	32.2	36.5
25	--	29	--	22.4	--	--	--	--	14.8	26.3	32.3	36.6
26	--	--	26.1	22.2	--	--	--	--	--	--	32.4	36.6
27	--	29	--	22	--	--	--	15	14.8	26.6	32.5	37
28	--	29.3	--	21.8	--	--	--	15	--	26.8	32.8	37
29	--	29.2	--	21.6	17	--	--	14.8	--	27		37.1
30	--	29.2	--	--	--	--	--	14.8	16.4	27.1		37.1
31		29.1		21	--		--		18.8	27.2		37.2

April 2005 - March 2006												
Day	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
1	37.4	41.5	47.5	41.7	--	34.5	--	--	--	--	--	--
2	37.3	41.6	--	--	37.8	--	--	--	--	--	--	--
3	37.4	41.7	44.4	--	37.6	--	--	--	--	--	--	--
4	37.9	41.8	44.4	--	--	33.7	--	--	--	--	--	--
5	38	42.1	44.1	--	37.3	33.5	--	--	--	--	--	--
6	38.1	42.3	--	--	--	33.4	--	--	--	--	--	--
7	38.4	42.2	--	41.2	37.3	33.4	--	--	--	--	--	--
8	38.4	42.4	--	41.2	37.1	33	--	--	--	--	--	--
9	38.6	43.4	43.4	--	37.1	32.6	--	--	--	--	--	--
10	38.7	43.4	44.4	40.9	37	32.2	--	--	--	--	--	--
11	38.8	43.5	43.6	40.8	--	32	--	--	--	--	--	--
12	38.9	43.5	--	40.8	36.6	31.8	--	--	--	--	--	--
13	38.8	43.6	43.5	--	36.5	31.7	--	--	--	--	--	--
14	38.9	--	43.6	40.6	--	31.5	--	--	--	--	--	--
15	39	--	--	--	36.5	31.5	--	--	--	--	--	--
16	39.2	44.4	43.5	40.3	--	31.3	--	--	--	--	--	--
17	39.4	44.5	43	--	37	31	--	--	--	--	--	--
18	39.5	44.8	--	40.2	36.8	30.9	--	--	--	--	--	--
19	39.6	--	42.6	--	--	30.8	--	--	--	--	--	--
20	40	--	42.7	39.9	--	30.7	--	--	--	--	--	--
21	40.1	--	42.5	39.7	36.4	30.7	--	--	--	--	--	--
22	40.2	--	--	39.5	36.3	30.6	--	--	--	--	--	--
23	40.5	--	--	--	36.2	30.5	--	--	--	--	--	--
24	40.5	--	42	--	36	30	--	--	--	--	--	--
25	40.6	44.7	41.9	39.2	--	30	--	--	--	--	--	--
26	40.7	44.7	42	--	--	29.9	--	--	--	--	--	--
27	40.8	--	41.9	38.9	--	30.3	--	--	--	--	--	--
28	41	--	--	38.8	--	30.3	--	--	--	--	--	--
29	41.1	--	--	38.4	--	30.2	--	--	--	--		--
30	41.3	--	41.8	--	--	30.2	--	--	--	--		--
31		--		--	--		--		--	--		--

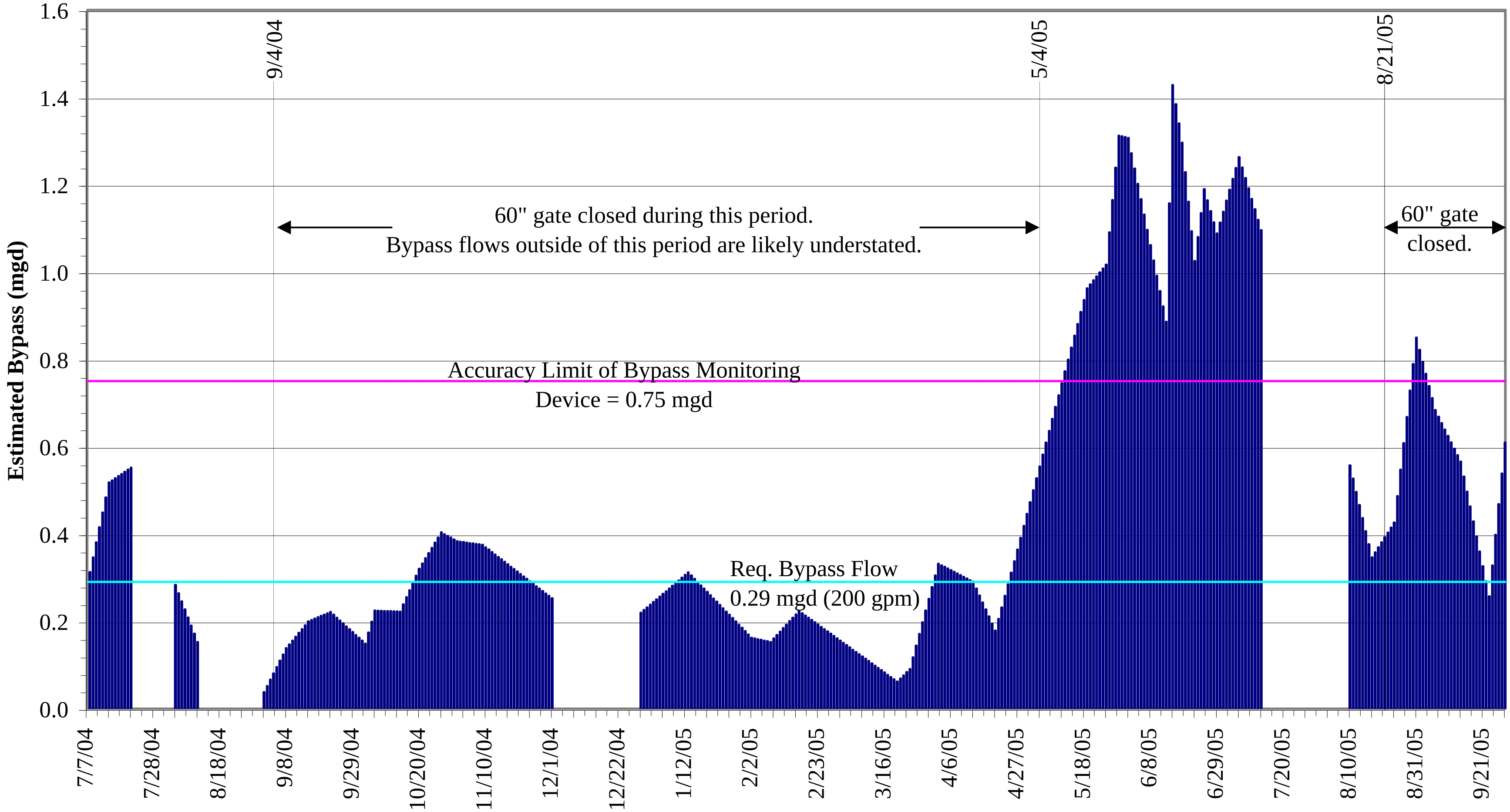
Figures

FIGURE 1
Gem Lake Precipitation
Accumlated Percent Departure From Annual Average
Water Years 1925-2004 and 1925-1998



6/7/2006

FIGURE 2
June Lake Public Utilities District
Fern Creek Diversion Facility - Estimated Daily Bypass Flows
July 7, 2004 to September 28, 2005



Note: Gaps in bypass flow due to missing data from 7/22/04 to 8/3/04, 8/12/04 to 8/31/04, 12/2/04 to 12/28/04, and 7/14/05 to 8/9/05.

FIGURE 3
June Lake Public Utilities District
Clark Water Treatment Plant Production
September 1, 2004 to October 5, 2005

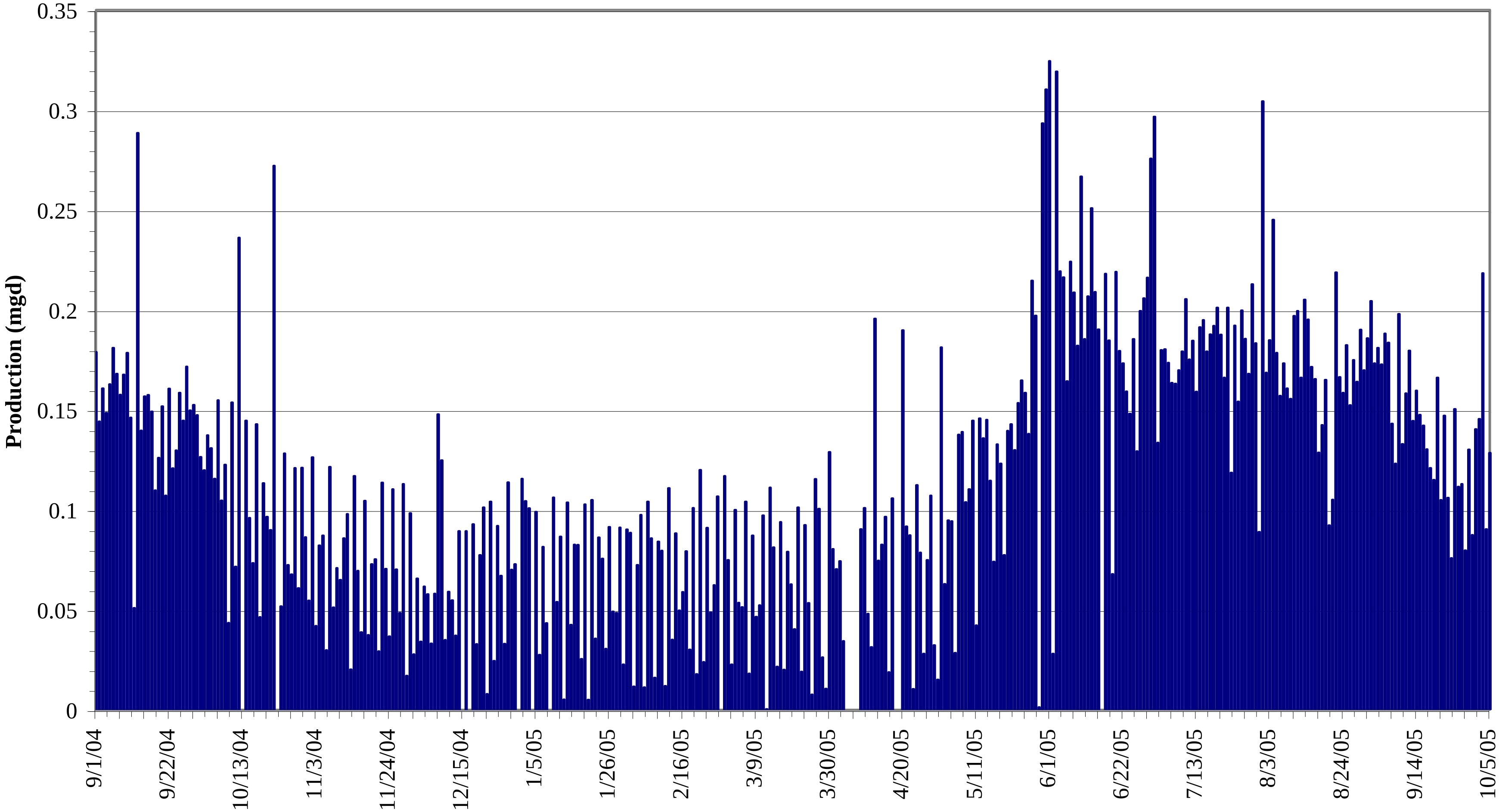


FIGURE 4
June Lake Public Utilities District
Estimated Daily Flow of Fern Creek Above Diversion Facility
9/4/04 to 12/1/04, 12/29/04 to 5/4/05 and 8/21/05 to 9/28/05

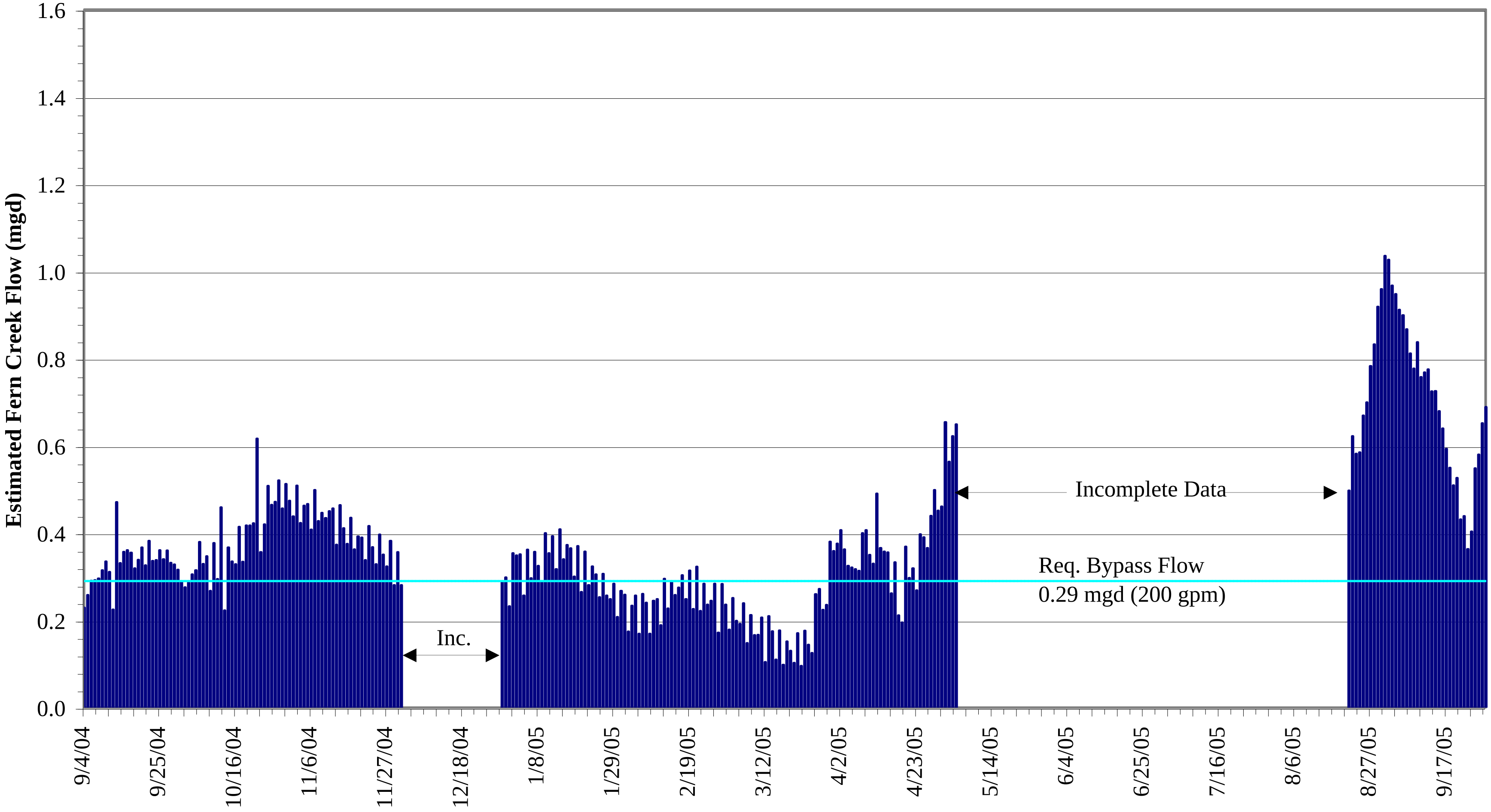


FIGURE 5
June Lake Public Utilities District
Estimated Daily Flow of Snow Creek Above Diversion Facility
9/4/04 to 12/1/04, 12/29/04 to 5/4/05 and 8/21/05 to 9/28/05

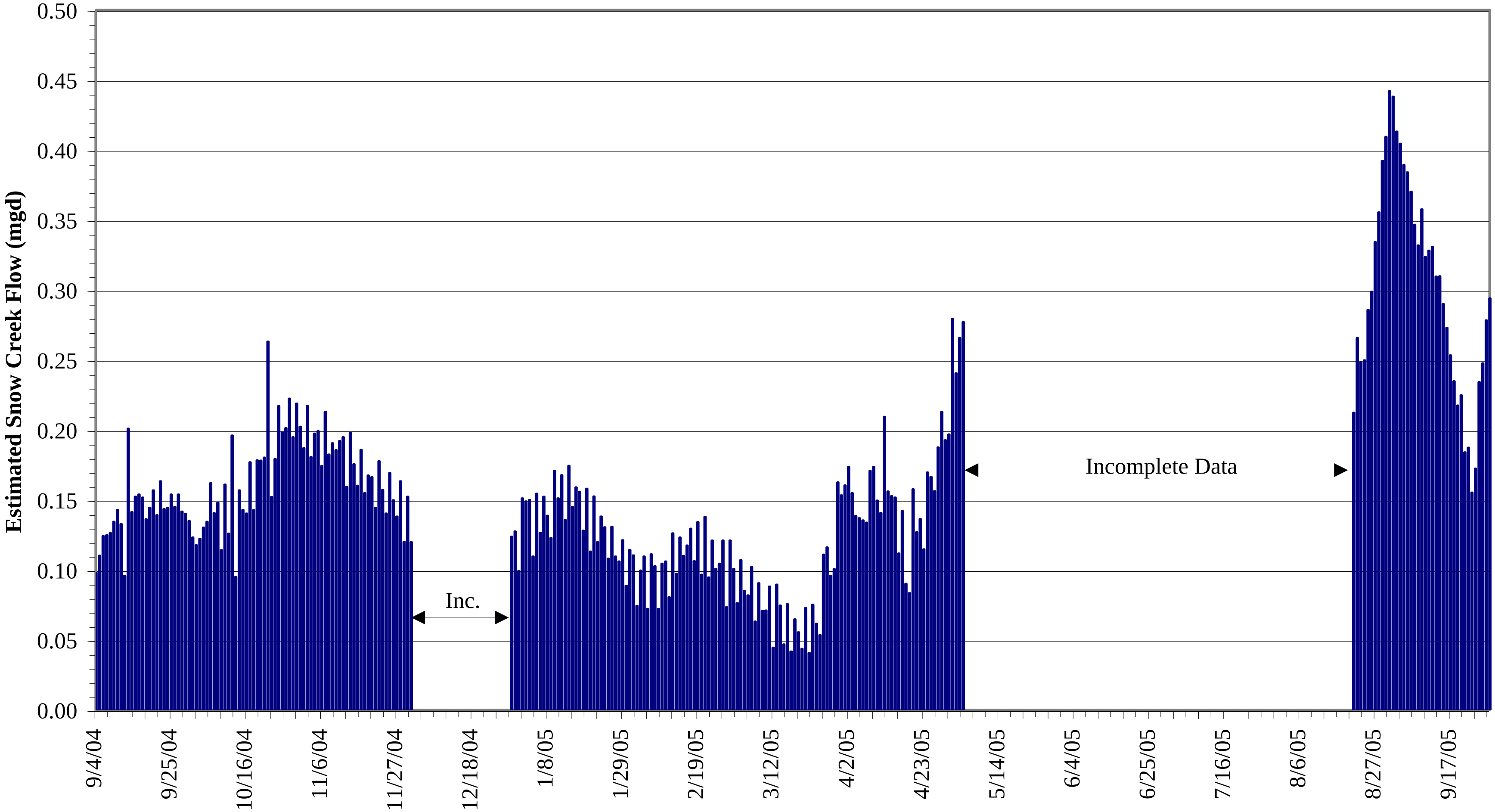
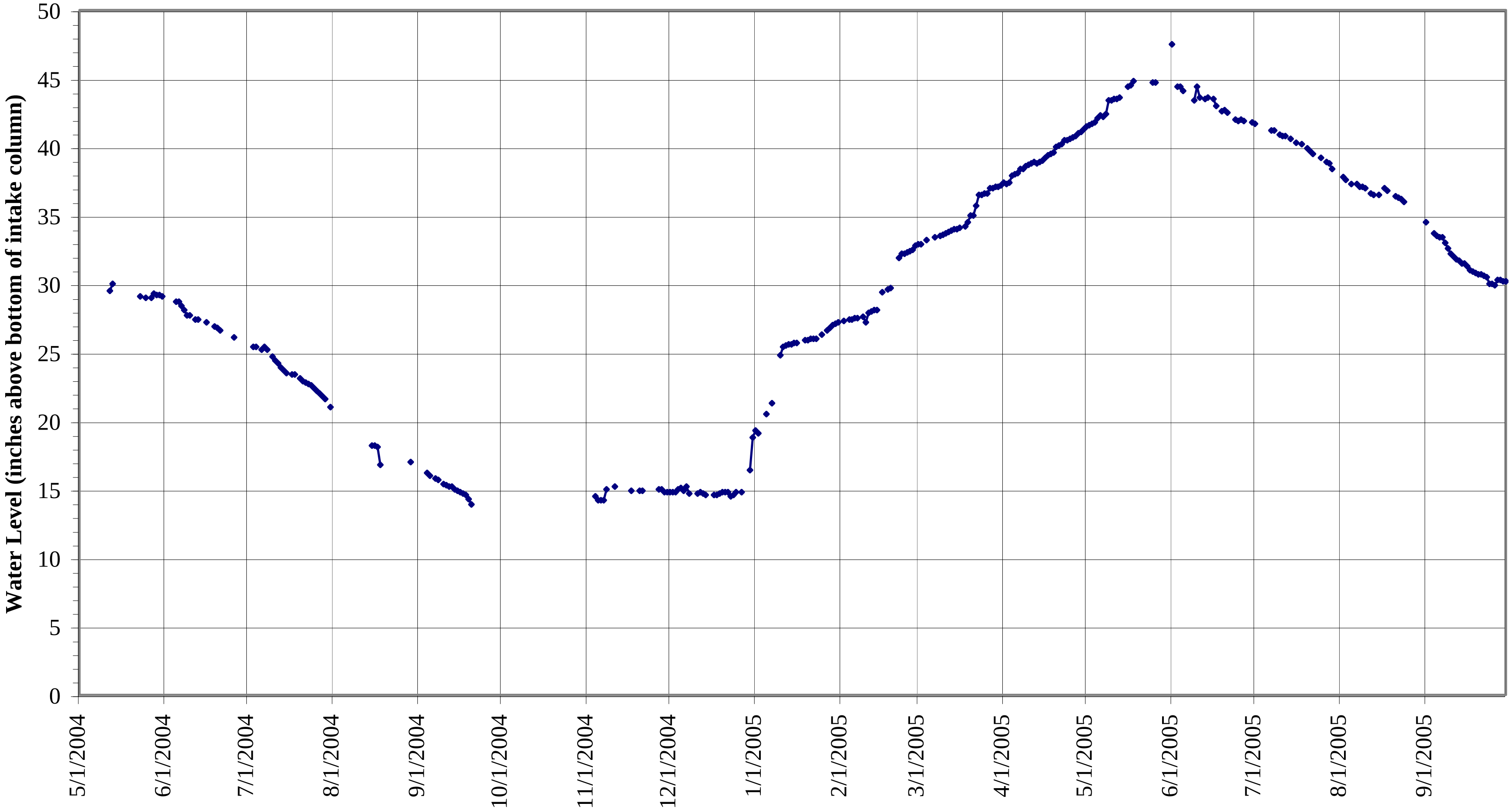


FIGURE 6
June Lake Public Utilities District
Measured June Lake Water Levels
May 2004 to September 2005



Plates

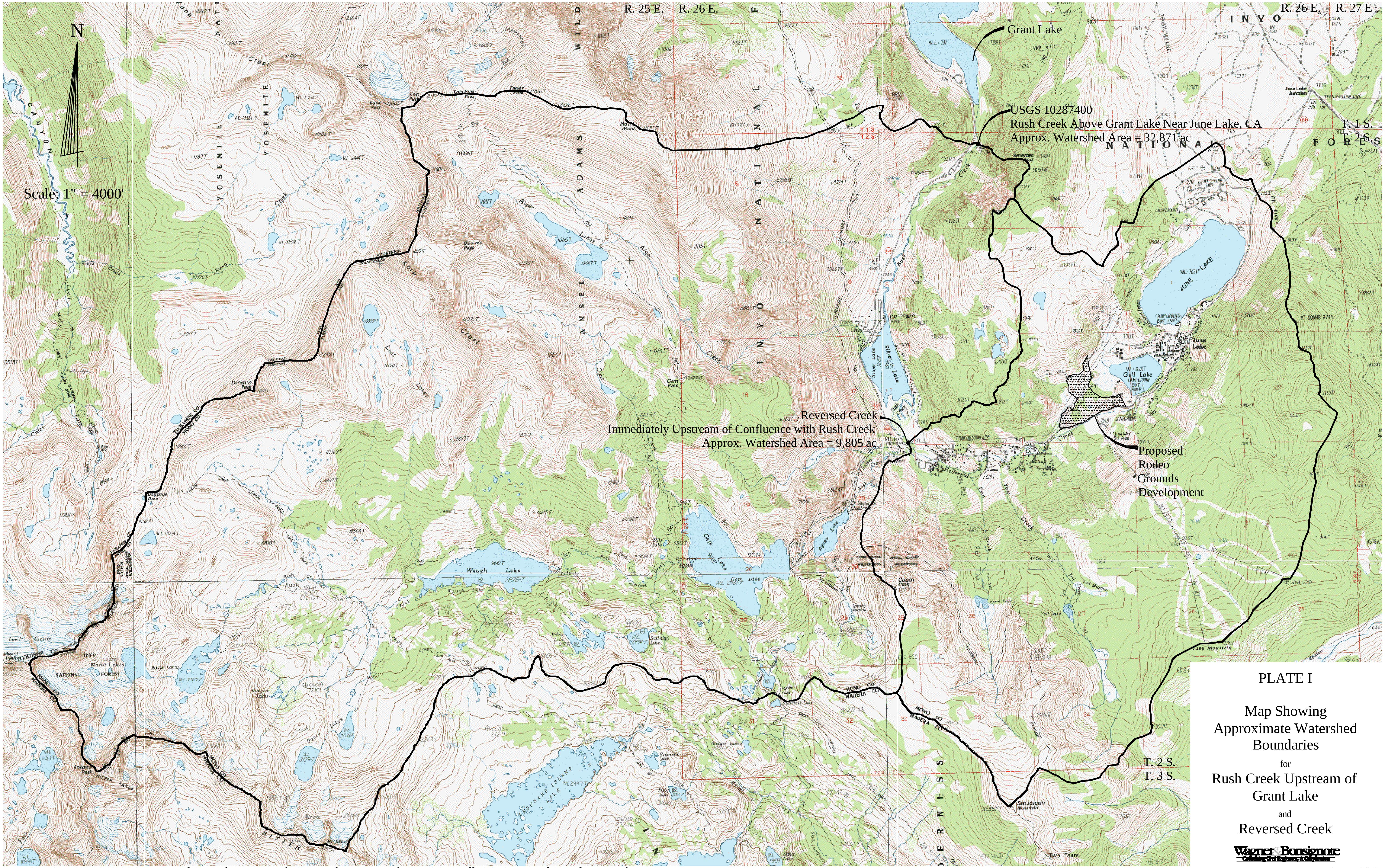


PLATE I

Map Showing
Approximate Watershed
Boundaries
for
Rush Creek Upstream of
Grant Lake
and
Reversed Creek

Wagner Bonsignore

June 2006

Base Map Per USGS 7.5 Minute Quad Maps for Koip Peak, June Lake, Mammoth Mt., Mt. Lyell, Mt. Ritter and Vogelsang Peak.

Q:\Drawings\Eco Logic\June Lake\dwg\Hydrology.dwg

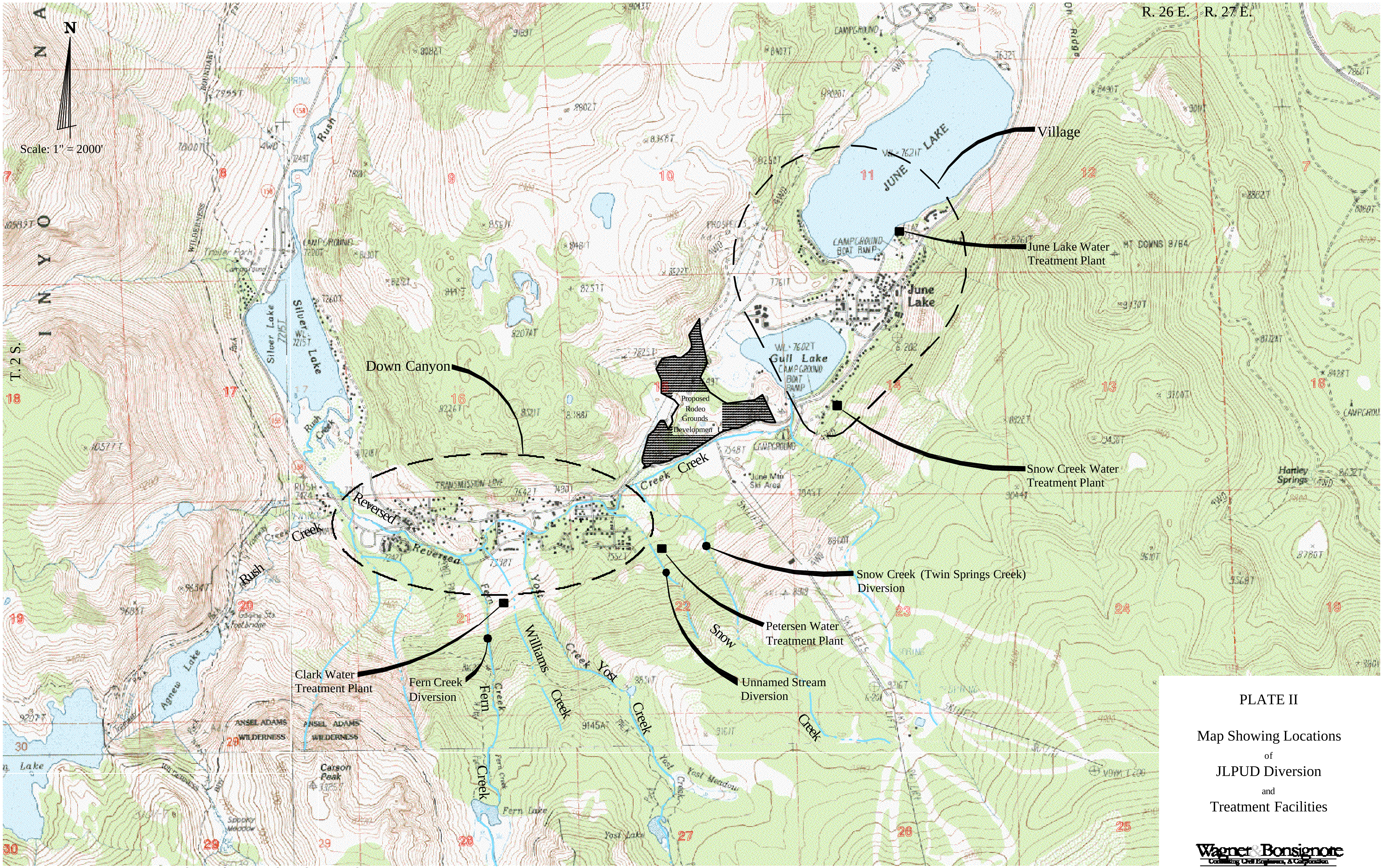


PLATE II

Map Showing Locations
of
JLPUD Diversion
and
Treatment Facilities

Wagner & Bonsignore
Consulting Civil Engineers, A Corporation

Base Map Per USGS 7.5 Minute Quad Maps for June Lake and Koip Peak

Q:\Drawings\Eco Logic\June Lake\dwg\Water Rights.dwg

June 2006

PLATE III

Map Showing
Appoximate Watershed Boundaries
of
Reversed Creek, June Lake
and
Other Points of Interest

Wagner Bonsignore
Consulting Civil Engineers, A Corporation

Base Map Per USGS 7.5 Minute Quad Maps for Koip Peak, June Lake, Mammoth Mt., and Mt. Ritter

Q:\Drawings\Eco Logic\June Lake\dwg\Hydrology.dwg

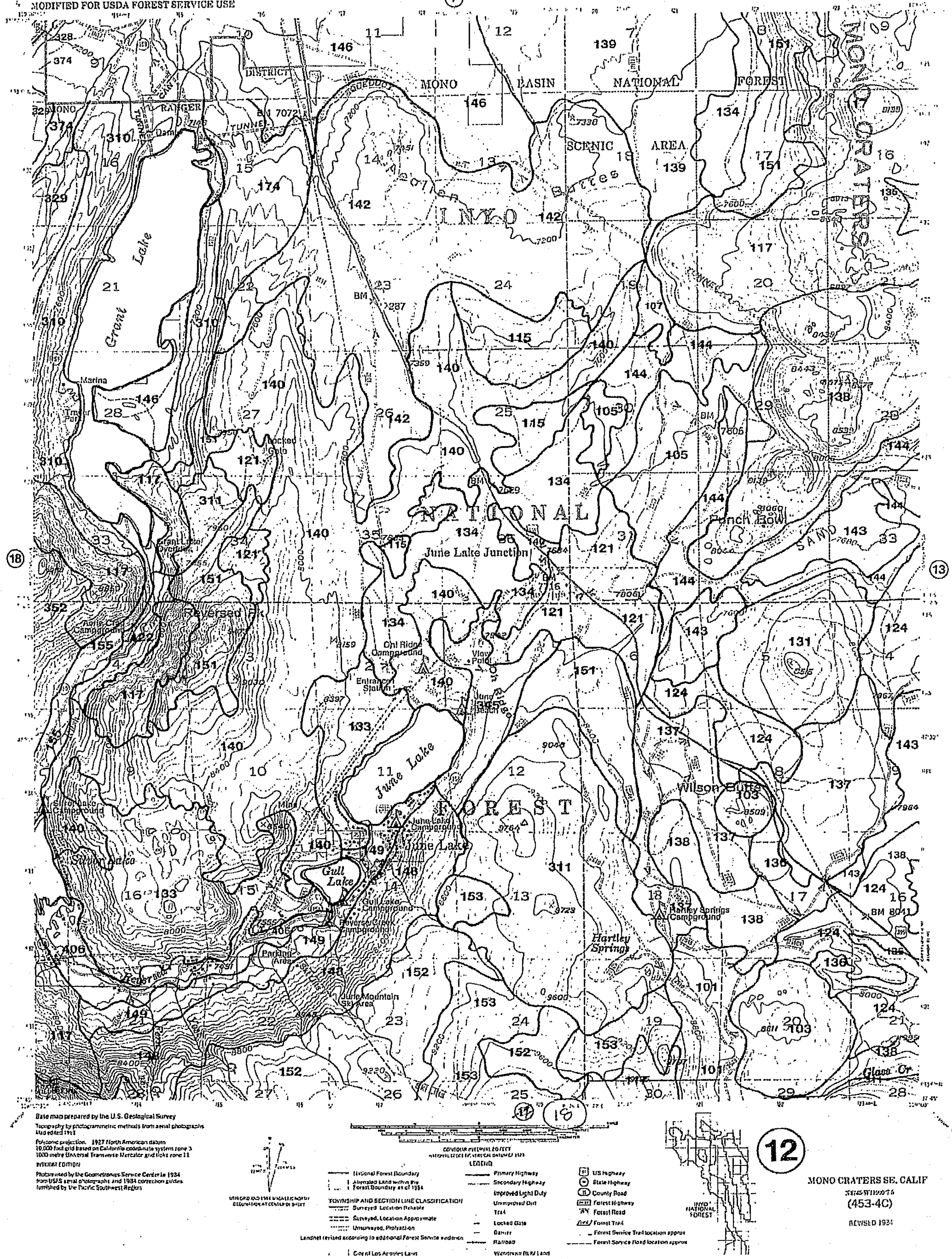
June 2006

Appendix A

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE

INYO NATIONAL FOREST AREA - WEST PART
ORDER 3 SOIL SURVEY - SEPTEMBER 1983

MONO CRATERS SE QUADRANGLE
MT DIABLO MERIDIAN
MONO CO., CALIFORNIA
7.5 MINUTE SERIES



Base map prepared by the U.S. Geological Survey

MONO CRATERS SE, CALIF

(453-4C)

REVISED 1984

133 - Corbett family - Rock outcrop - Railcity family complex, 15 to 30 percent slopes

Elevation: 7,400 to 8,400 feet   Annual Precipitation: 10 to 20 Inches

Soil Map Unit Components	Corbett family	Rock outcrop, rhyolitic	Railcity family
Approx. Proportion	40 percent	20 percent	15 percent
Landscape Position	Mountainsides	Mountainsides & Ridges	Mountainsides, near Rock outcroppings
Slope	15 to 30 percent	—	15 to 30 percent slopes
Typical Vegetation	Jeffrey Pine	Barren	Jeffrey Pine

Soil Profile Description

Surface Layer	0 to 3 inches; light brownish gray gravelly loamy sand; weak subangular blocky structure; soft; pH 6.0	Rock outcrop consists of continuous bare bedrock & less than 15 percent inclusions of soil material capable of supporting plants.	1 to 0 inch; decomposing Jeffrey Pine needles & twigs, and Big Sagebrush leaves 0 to 14 inches; grayish brown gravelly & extremely stony
Subsoil	—	—	—
Substratum	3 to 52 inches; light gray & white gravelly loamy sand & extremely gravelly loamy sand; massive; soft; pH 6.5 52 inches; soft rhyolitic tuff	—	14 to 60 inches; light brownish gray & gray very cobbly & very stony coarse sand; massive; pH 6.5 to 7.0

Soil Properties

Restrictive Layer Depth	52 inches (FB)	—	Greater than 60 inches
Effective Rooting Depth (inches)	Deep (40 to 60 inches)	—	Very Deep (> 60 inches)
Available Water Capacity	Low (2.4 inches)	—	Very Low (1.7 inches)
Water Retention Class	3 (1.1 inches)	—	3 (0.5 inch)
Hydrologic Soil Group	A	—	A
Permeability (in/hr.)	Rapid (6 to 20 in./hr.)	—	Very Rapid (20+ in./hr.)
Drainage Class	Somewhat Excessively	—	Somewhat Excessively
Max Erosion Hazard	Moderate	—	Low to Moderate
Erosion Factor (k)	0.17	—	0.05
Soil Productivity	Low	—	
Soil Manageability Group	IV	—	IV
Class	4PXe	—	4PXe
Annual Forage Production (lb/acre)	< 200	—	< 200
Forest Survey Site Class	5	—	6-7

Included Areas & Remarks

Included in this map unit are small areas of the Corbett & Railcity families, 0 to 15 percent slopes, on gentler mountainsides; the Haypress family, on mountainsides; a soil similar to the Corbett family, but with higher amounts of rock fragments in the lower 30 inches of the profile, 0 to 15 percent slopes, on gentler mountainsides; a soil similar to Xeric Torriorthents, shallow, but with hard bedrock, the Stecum family, but with few approximately 25 percent of the

140 - Cozetica family - Rock outcrop association, 15 to 60 percent slopes

Elevation: 7,200 to 9,200 feet   Annual Precipitation: 10 to 25 inches

Soil Map Unit Components	Cozetica family	Rock outcrop
Approx Proportion	50 percent	20 percent
Landscape Position	Mountainsides & Moraines	Mountainsides, Sideslopes of Moraines & Ridges
Slope	15 to 60 percent	—
Typical Vegetation	Big Sagebrush	Barren

Soil Profile Description

Surface Layer	0 to 6 inches; grayish brown & light brownish gray gravelly sand; single grain; loose; pH 5.5 to 6.2	Rock outcrop consists of continuous bare bedrock & less than 15 percent inclusions of soil material capable of supporting plants.
Subsoil	—	—
Substratum	6 to 60 inches; light gray & very pale brown loamy sand & gravelly coarse sand; single grain; loose; pH 5.4 to 6.1	—

Soil Properties

Restrictive Layer Depth	Greater than 60 inches	—
Effective Rooting Depth (inches)	Very Deep (> 60 inches)	—
Available Water Capacity	Moderate (4.1 inches)	—
Water Retention Class	2 (1.6 inches)	—
Hydrologic Soil Group	A	—
Permeability (in/hr)	Rapid (6 to 20 in./hr.)	—
Drainage Class	Somewhat Excessively	—
Max Erosion Hazard	Low to High	—
Erosion Factor (k)	0.08	—
Soil Productivity	Low	—
Soil Manageability		
Annual Forage Production (lb/acre)	200 to 400	—
Forest Survey Site Class	NC	—

Included Areas & Remarks

Included in this map unit are small areas of the Cozetica family, 0 to 15 percent slopes; a soil similar to the Cozetica family, but shallow to hard bedrock, on mountainsides & moraines, near rock outcroppings; a soil similar to the Berent family, but colder, on mountainsides; and Aquic Haploxerolls, 0 to 15 percent slopes, in concave areas & basins. Included areas make up approximately 30 percent of the map unit area.

148 - Stecum - Salt Chuck families complex, 30 to 75 percent slopes

Elevation: 7,400 to 9,200 feet   Annual Precipitation: 12 to 20 Inches

Soil Map Unit Components	Stecum family	Salt Chuck family
Approx Proportion	50 percent	20 percent
Landscape Position	Moraines	Moraines
Slope	30 to 75 percent	30 to 75 percent
Typical Vegetation	Lodgepole Pine	Lodgepole Pine

Soil Profile Description

	Stecum family	Salt Chuck family
Surface Layer	0 to 9 inches; light gray very cobbly loamy sand; single grain; loose; pH 5.5	0 to 14 inches; dark grayish brown & brown extremely stony loamy sand; single grain; loose; pH 5.9
Subsoil	9 to 24 inches; light brownish gray very cobbly loamy sand; single grain; loose; pH 5.5	—
Substratum	24 to 60 inches; light yellowish brown very cobbly loamy coarse sand; massive; soft; pH 5.5	14 to 33 inches; light yellowish brown & light gray very gravelly & extremely stony loamy sand; massive; slightly hard; pH 6.1 33 inches; soft decomposing granitic bedrock

Soil Properties

	Stecum family	Salt Chuck family
Restrictive Layer Depth	Greater than 60 inches	33 Inches (FB)
Effective Rooting Depth (inches)	Very Deep (> 60 inches)	Mod. Deep (20 to 40 inches)
Available Water Capacity	Very Low (2.0 inches)	Very Low (0.5 Inches)
Water Retention Class	3 (0.8 inches)	3 (0.5 Inches)
Hydrologic Soil Group	A	B-C
Permeability (in./hr.)	Rapid (6 to 20 in./hr.)	Rapid (6 to 20 in./hr.)
Drainage Class	Somewhat Excessivley	Somewhat Excessively
Max Erosion Hazard	Moderate to Very High	Moderate to Very High
Erosion Factor (k)	0.10	0.05
Soil Productivity	Low	Low
Soil Manageability Group	IV	IV
Class	4EPg	4EPg
Annual Forage Production (lb/acre)	< 300	200 to 400
Forest Survey Site Class	6-7	6-7

Included Areas & Remarks

Included in this map unit are small areas of a soil similar to Vitrandic Cryorthents, but with sandy-skeletal textures at depths greater than 25 inches; a soil similar to the Stecum family, but buried under 20 inches of pumice; Lithic Cryorthents, Vitrandic Cryopsamments, Nanamkin family & Rock outcrop. Included areas make up approximately 30 percent of the map unit area.

149 - Nanamkin family - Vitrandic Haploxerolls complex, 15 to 30 percent slopes

Elevation: 7,200 to 7,800 feet. Annual Precipitation: 10 to 15 inches

Soil Map Unit Components	Nanamkin family	Vitrandic Haploxerolls, warm
Approx Proportion	50 percent	30 percent
Landscape Position	Mountain Toeslopes	Mountain Toeslopes
Slope	15 to 30 percent	15 to 30 percent
Typical Vegetation	Lodgepole Pine	Jeffrey Pine
Soil Profile Description		
Surface Layer	0 to 7 inches; brown very cobbly loamy sand; weak subangular blocky structure; soft; pH 7.0	1/4 to 0 inch; decomposing Big Sagebrush & Bitterbrush plant parts 0 to 10 inches; grayish brown gravelly coarse sand & loamy coarse sand; single grain & massive; loose & soft; pH 6.5
Subsoil	—	—
Substratum	7 to 60 inches; yellowish brown very cobbly loamy sand; massive; soft; pH 7.0	10 to 60 inches; light brownish, pinkish gray & pale brown gravelly coarse sand, loamy coarse sand & loamy sand; massive; soft; pH 7.0
Soil Properties		
Restrictive Layer Depth	Greater than 60 inches	Greater than 60 inches
Effective Rooting Depth (inches)	Very Deep (> 60 inches)	Very Deep (> 60 inches)
Available Water Capacity	Very Low (2.3 inches)	Low (3.4 inches)
Water Retention Class	3 (0.8 inches)	3 (1.1 inches)
Hydrologic Soil Group	A	A
Permeability (in/hr)	Rapid (6 to 20 in./hr.)	Rapid (6 to 20 in./hr.)
Drainage Class	Somewhat Excessively	Somewhat Excessively
Max Erosion Hazard	Low to Moderate	Low
Erosion Factor (k)	0.05	0.10
Soil Productivity	Low	Low to Moderate
Soil Manageability Group	III	III
Soil Manageability Class	3Pe	3P
Annual Forage Production (lb/acre)	200 to 400	300 to 500
Forest Survey Site Class	6-7	5

Included Areas & Remarks

Included in this map unit are small areas of the Railcity & Lakash families. Included areas make up approximately 20 percent of the map unit area.

311 - Vitrandic Xeropsamments - Rock outcrop complex, 30 to 60 percent slopes

Elevation: 8,300 to 9,900 feet   Annual Precipitation: 15 to 25 inches

Soil Map Unit Components	**Vitrandic Xeropsamments**	**Rock outcrop, rhyolitic**
Approx Proportion	50 percent	25 percent
Landscape Position	Mountainsides	Mountainsides & Ridges
Slope	15 to 30 percent	—
Typical Vegetation	Lodgepole & Jeffrey Pine	Barren
Soil Profile Description		
Surface Layer	2 to 0 inches; decomposing Lodgepole and Jeffrey Pine needles and twigs 0 to 7 inches; pale brown loamy coarse sand; weak granular structure; soft; pH 5.6	Rock outcrop consists of continuous bare bedrock & less than 15 percent inclusions of soil material capable of supporting plants.
Subsoil	—	—
Substratum	7 to 60 inches; very pale brown & light gray loamy sand; weak granular structure; soft; pH 4.9	—
Soil Properties		
Restrictive Layer Depth	Greater than 60 inches	—
Effective Rooting Depth (inches)	Very Deep (> 60 inches)	—
Available Water Capacity	Moderate (4.4 inches)	—
Water Retention Class	2 (1.4 inches)	—
Hydrologic Soil Group	A	—
Permeability (in/hr)	Rapid (6 to 20 in./hr.)	—
Drainage Class	Somewhat Excessively	—
Max Erosion Hazard	Low to Moderate	—
Erosion Factor (k)	0.15	—
Soil Productivity	Low	—
Soil Manageability Group	III	—
Class	3Xep	—
Annual Forage Production (lb/acre)	200 to 400	—
Forest Survey Site Class	5-7	—

Included Areas & Remarks

Included in this map unit are small areas of the Fez family, Vitrandic Xerorthents, Vitrandic Xerorthents, ashy & Vitrandic Xerorthents, pumiceous. Included areas make up approximately 25 25 percent of the map unit area.

345 - Corbett - Nanamkin families - Rock outcrop complex, 30 to 60 percent slopes

Elevation: 7,200 to 9,800 feet   Annual Precipitation: 10 to 25 inches

Soil Map Unit Components	Corbett family	Nanamkin family	Rock outcrop, granitic
Approx Proportion	35 percent	25 percent	15 percent
Landscape Position	Mountainsides	Mountainsides	Mountainsides & Ridges
Slope	30 to 60 percent	30 to 60 percent	—
Typical Vegetation	Lodgepole & Jeffrey Pine	Lodgepole Pine & Big Sagebrush	Barren

Soil Profile Description

Surface Layer	0 to 3 inches; light brownish bray gravelly loamy sand; weak subangular blocky structure; soft; pH 6.0	0 to 7 inches; brown very cobbly loamy sand; weak subangular blocky structure; soft; pH 7.0	Rock outcrop consists of bare bedrock & less than 15 percent inclusions of soil material capable of supporting plants.
Subsoil	—	—	—
Substratum	3 to 52 inches; light gray & white gravelly loamy sand & extremely gravelly loamy sand; massive; soft; pH 6.5 52 inches; soft granitic bedrock	7 to 60 inches; yellowish brown very cobbly loamy sand; massive; soft; pH 7.0	—

Soil Properties

Restrictive Layer Depth	52 inches (FB)	Greater than 60 inches	—
Effective Rooting Depth (inches)	Deep (40 to 60 inches)	Very Deep (> 60 inches)	—
Available Water Capacity	Low (2.4 inches)	Very Low (2.3 inches)	—
Water Retention Class	3 (1.1 inches)	3 (0.8 inches)	—
Hydrologic Soil Group	A	A	—
Permeability (in/hr)	Rapid (6 to 20 in./hr.)	Rapid (6 to 20 in./hr.)	—
Drainage Class	Somewhat Excessively	Somewhat Excessively	—
Max Erosion Hazard	Moderate to High	Moderate to High	—
Erosion Factor (k)	0.17	0.05	—
Soil Productivity	Very Low	Low	—
Soil Manageability Group	IV	IV	—
Class	4EPgx	4EPgx	—
Annual Forage Production (lb/acre)	< 200	200 to 400	—
Forest Survey Site Class	5-7	6-7	—

Included Areas & Remarks

Included in this map unit are small areas of the Stecum, at higher elevations, Haypress, Biglake, families, Vitrandic Xeropsamments & Vitrandic Xerochrepts. Included areas make up approximately 25 percent of the map unit area.

Appendix B

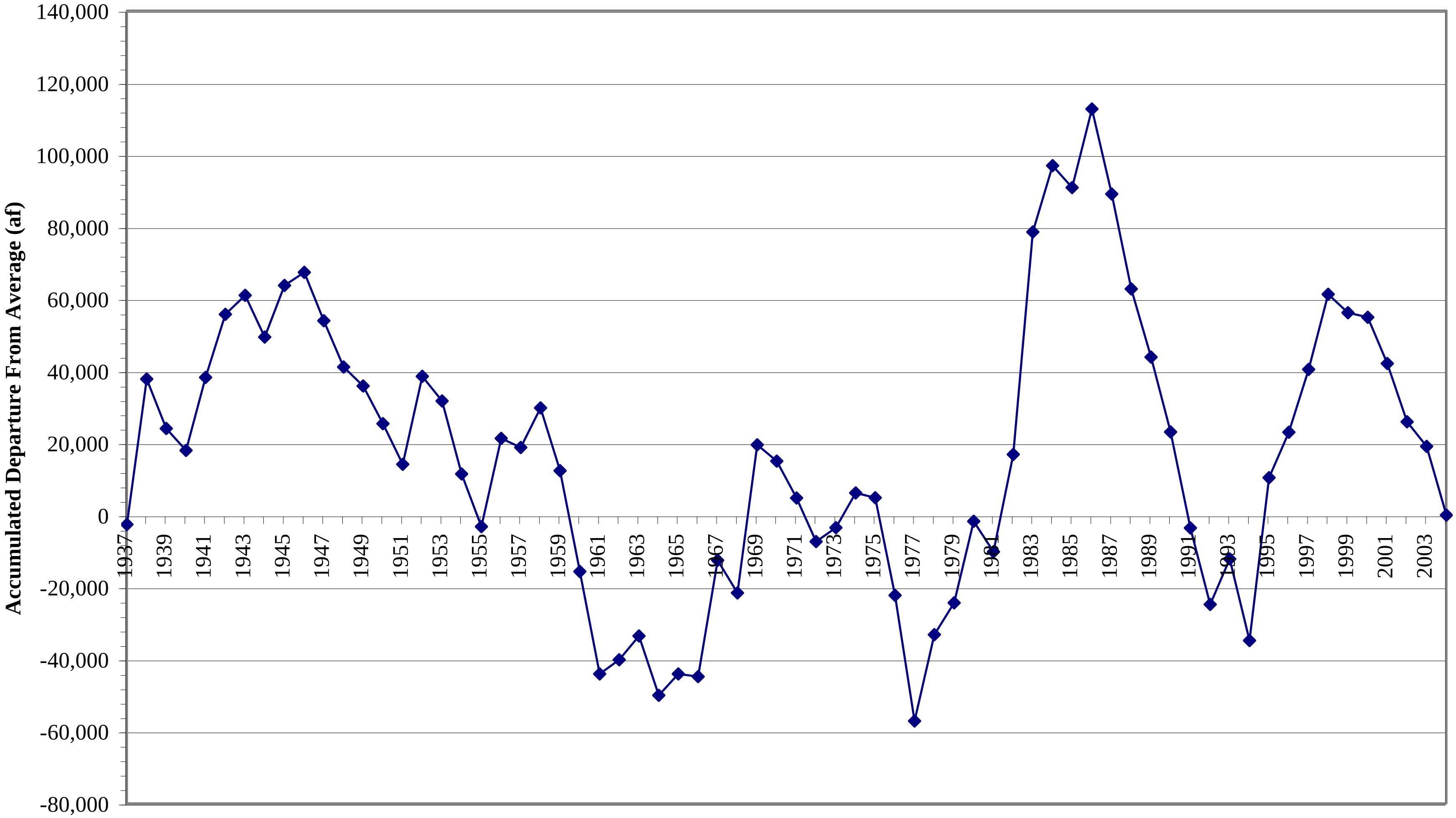
Monthly Flows For Rush Creek Above Grant Lake,
Water Years 1937 to 2005[1]

Water Year	Monthly Mean Discharge (af)												Annual Total	Departure From Average	Accumulated Departure
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
1937	1,845	2,350	3,277	4,212	3,604	3,001	2,880	8,547	10,116	7,256	5,472	4,130	**56,689**	-2,612	-2,612
1938	3,880	2,469	3,148	2,736	3,171	5,024	5,766	11,683	20,053	26,624	9,285	5,837	**99,676**	40,375	37,763
1939	5,503	5,653	4,378	3,234	2,532	5,405	6,307	4,599	3,064	1,998	1,654	1,220	**45,549**	-13,752	24,011
1940	2,927	2,957	2,859	2,496	2,583	4,667	3,975	8,854	8,926	4,937	4,132	3,892	**53,205**	-6,096	17,915
1941	2,994	2,755	2,527	4,052	3,249	3,216	4,266	11,375	13,091	19,922	6,887	5,272	**79,607**	20,305	38,220
1942	2,257	5,445	5,472	3,536	3,732	3,738	5,843	8,178	12,853	12,974	6,887	5,855	**76,769**	17,468	55,688
1943	4,950	3,148	3,087	2,748	2,588	3,898	5,837	10,022	10,532	8,485	6,210	3,082	**64,589**	5,288	60,976
1944	4,569	3,850	2,822	2,527	3,325	1,912	1,684	7,379	9,461	4,937	1,599	3,660	**47,724**	-11,577	49,399
1945	5,552	3,612	3,044	2,466	2,955	4,027	4,713	11,498	13,745	14,511	4,790	2,725	**73,638**	14,337	63,736
1946	3,911	3,969	4,083	3,160	2,577	3,603	6,426	10,883	9,878	5,964	4,593	3,850	**62,898**	3,597	67,333
1947	6,118	5,314	3,579	3,868	4,032	2,429	2,577	4,187	3,618	3,105	4,150	2,904	**45,880**	-13,421	53,911
1948	4,396	3,618	1,875	1,918	1,766	1,125	1,422	2,933	10,651	8,485	4,163	4,118	**46,471**	-12,830	41,081
1949	5,171	2,934	2,066	2,367	3,010	2,626	3,820	5,811	9,164	5,485	5,817	5,748	**54,017**	-5,284	35,798
1950	4,015	2,285	1,925	1,691	1,522	3,382	3,380	7,747	8,390	6,579	5,768	2,178	**48,861**	-10,440	25,358
1951	695	2,577	4,655	3,855	3,127	2,638	3,100	4,599	6,724	6,149	5,860	4,028	**48,006**	-11,295	14,063
1952	5,220	1,696	1,549	1,900	3,917	3,917	5,730	12,728	13,805	20,168	7,809	5,332	**83,771**	24,470	38,533
1953	5,989	5,605	3,659	3,825	3,277	2,103	1,874	3,056	6,664	8,547	5,214	2,624	**52,437**	-6,864	31,668
1954	3,253	2,624	1,629	2,306	2,521	3,339	4,641	9,100	6,486	2,244	503	383	**39,030**	-20,271	11,397
1955	4,058	2,737	1,390	1,580	2,905	4,157	4,088	5,233	8,688	1,789	2,736	5,367	**44,727**	-14,574	-3,177
1956	5,583	2,362	3,363	4,421	5,131	4,562	3,493	8,977	13,745	19,369	7,010	5,736	**83,753**	24,452	21,275
1957	5,934	4,641	2,945	2,595	2,360	3,732	2,809	4,925	10,413	4,784	5,891	5,724	**56,753**	-2,548	18,727
1958	2,300	2,339	2,429	2,300	1,072	1,304	3,636	11,252	13,567	16,110	8,116	5,909	**70,332**	11,031	29,758
1959	5,921	3,975	1,162	1,021	2,632	4,329	4,742	5,214	5,147	3,056	1,814	2,844	**41,858**	-17,443	12,315
1960	3,462	1,226	1,562	1,925	1,173	1,107	1,363	4,679	6,962	2,988	1,549	3,350	**31,346**	-27,955	-15,641
1961	3,597	3,796	4,070	1,888	866	941	1,351	2,595	6,486	1,537	707	3,005	**30,839**	-28,462	-44,102
1962	2,810	3,731	2,109	2,546	2,410	3,757	5,510	7,932	11,663	8,854	6,333	5,587	**63,242**	3,941	-40,161
1963	5,645	3,136	2,466	3,529	4,321	1,279	2,053	6,764	12,020	12,113	6,764	5,843	**65,932**	6,630	-33,531
1964	3,837	5,224	3,579	1,574	2,100	2,269	2,463	4,913	5,950	5,282	2,109	3,475	**42,775**	-16,526	-50,057
1965	2,293	2,309	2,951	4,366	3,327	3,001	3,713	8,116	10,354	9,899	9,100	5,867	**65,296**	5,995	-44,062
1966	5,048	4,915	2,982	3,185	2,799	3,609	6,545	8,485	7,795	6,641	4,341	2,166	**58,512**	-789	-44,850
1967	1,273	1,910	2,435	1,998	2,277	3,738	2,172	8,116	15,114	37,138	9,838	5,570	**91,580**	32,279	-12,572
1968	5,436	5,742	5,964	3,714	2,657	2,816	2,874	4,944	5,451	4,642	3,400	2,654	**50,294**	-9,007	-21,579
1969	2,127	1,940	1,931	2,429	3,077	3,923	6,248	16,848	26,182	21,029	8,362	6,307	**100,402**	41,101	19,523
1970	6,518	4,957	2,773	3,197	2,893	3,105	3,475	6,210	8,628	5,595	4,692	2,725	**54,769**	-4,532	14,990
1971	2,693	2,648	2,632	2,601	2,444	3,456	3,130	4,618	8,688	7,870	4,882	3,350	**49,011**	-10,290	4,700
1972	3,357	3,130	3,290	3,167	2,939	2,816	2,600	5,835	8,450	5,417	3,093	3,172	**47,265**	-12,036	-7,336
1973	2,779	2,838	2,724	2,613	2,888	3,904	5,671	11,990	12,377	8,854	4,765	1,726	**63,130**	3,829	-3,507
1974	3,074	3,529	3,769	4,107	3,532	4,286	4,421	9,039	10,889	8,362	8,239	5,683	**68,931**	9,630	6,123
1975	5,688	3,677	1,943	1,740	1,761	2,152	3,172	7,133	12,079	8,731	6,456	3,463	**57,995**	-1,306	4,816

Water Year	Monthly Mean Discharge (af)												Annual Total	Departure From Average	Accumulated Departure
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
1976	3,769	3,076	3,449	3,001	2,404	2,183	1,928	3,197	2,690	1,918	2,626	1,999	**32,241**	-27,060	-22,244
1977	2,318	1,946	1,593	1,752	1,688	1,918	2,005	2,091	3,195	2,490	1,795	1,607	**24,399**	-34,902	-57,146
1978	1,838	1,851	1,605	1,648	1,727	3,437	5,254	8,547	18,684	20,291	10,576	7,795	**83,253**	23,952	-33,194
1979	5,245	5,950	3,935	4,193	3,627	3,745	4,320	9,961	10,473	7,747	6,130	2,838	**68,165**	8,864	-24,330
1980	2,921	2,678	2,662	3,165	2,713	4,239	6,025	9,801	13,262	19,778	8,603	6,098	**81,945**	22,644	-1,686
1981	5,001	4,325	3,040	2,519	2,323	2,504	4,658	6,963	7,166	5,141	4,333	2,831	**50,804**	-8,497	-10,183
1982	2,361	2,579	2,688	2,865	2,718	4,396	6,011	11,951	18,065	15,739	9,312	7,621	**86,306**	27,005	16,822
1983	7,890	6,486	7,006	5,975	4,948	4,630	4,290	9,091	24,891	21,979	16,299	7,528	**121,013**	61,712	78,534
1984	5,686	6,554	5,832	5,429	5,044	5,569	4,558	9,442	9,725	8,154	6,624	5,118	**77,735**	18,434	96,968
1985	4,269	4,996	5,157	3,205	1,911	2,077	5,515	8,486	7,496	4,558	1,652	3,894	**53,216**	-6,085	90,882
1986	2,542	2,612	2,508	2,559	3,562	5,186	7,311	11,354	18,289	13,444	6,932	4,787	**81,086**	21,785	112,667
1987	3,798	4,923	4,011	2,819	1,371	1,539	2,031	3,819	3,656	2,870	2,503	2,380	**35,720**	-23,581	89,086
1988	2,752	1,966	2,120	2,951	3,337	4,057	2,183	3,052	3,645	2,727	2,323	1,881	**32,994**	-26,307	62,779
1989	1,871	1,957	2,225	2,357	3,662	3,796	5,173	5,412	5,570	3,929	2,371	2,020	**40,343**	-18,958	43,821
1990	2,448	2,622	2,186	3,203	2,861	4,332	5,017	3,818	3,990	3,139	2,576	2,330	**38,522**	-20,779	23,042
1991	2,595	1,852	1,872	1,575	1,342	2,140	1,384	4,334	6,220	3,876	2,832	2,629	**32,651**	-26,650	-3,608
1992	2,585	2,621	2,674	2,704	2,673	3,701	5,205	5,248	3,693	2,501	2,018	2,488	**38,111**	-21,190	-24,798
1993	2,564	2,546	2,622	2,986	2,674	4,376	4,138	10,980	12,449	14,598	7,155	4,839	**71,927**	12,626	-12,172
1994	5,103	2,896	2,997	2,938	2,673	2,546	3,483	4,379	4,053	2,582	1,593	1,382	**36,625**	-22,676	-34,848
1995	1,847	2,354	2,898	3,466	3,504	5,080	3,263	10,075	19,797	29,237	15,556	7,477	**104,554**	45,253	10,405
1996	6,078	3,839	3,952	3,259	3,583	4,100	5,955	10,671	12,183	7,254	5,781	5,259	**71,914**	12,613	23,018
1997	5,627	4,256	4,101	8,817	5,003	3,955	4,682	10,136	9,424	7,884	7,095	5,731	**76,711**	17,410	40,428
1998	4,622	3,202	2,332	2,317	2,344	3,850	4,066	6,717	12,522	22,931	8,341	6,909	**80,153**	20,852	61,279
1999	6,143	4,669	3,827	3,700	3,248	3,188	2,177	5,852	7,601	8,259	2,615	2,891	**54,170**	-5,131	56,148
2000	6,123	4,481	3,645	2,180	2,323	3,732	3,642	5,663	12,964	6,775	2,456	4,054	**58,038**	-1,263	54,885
2001	5,547	5,713	3,990	2,516	1,573	2,141	2,731	8,447	6,497	3,567	828	2,947	**46,497**	-12,804	42,081
2002	3,451	3,889	4,032	3,926	3,747	4,670	4,305	4,617	4,143	2,325	1,441	2,567	**43,113**	-16,188	25,893
2003	5,254	4,312	3,056	3,101	2,834	3,309	2,180	4,078	10,862	5,392	2,952	5,121	**52,451**	-6,850	19,043
2004	3,549	2,767	3,104	3,102	3,103	4,048	2,978	3,640	3,669	3,931	3,389	2,978	**40,258**	-19,043	0
2005	3,538	3,092	3,252	3,451	4,220	6,395									
Average	**4,000**	**3,487**	**3,079**	**3,001**	**2,867**	**3,408**	**3,915**	**7,336**	**9,923**	**9,168**	**5,143**	**4,035**	**59,301**		

Notes:
(1) USGS #10287400 Rush Creek Above Grant Lake Near June Lake, CA (October 1937 - December 1979), LADWP Rush Creek at Dam Site (Grant Lake) (January 1980 - March 2005).

Rush Creek Above Grant Lake
Accumulated Departure From Average
Water Years 1937 to 2004



Appendix C

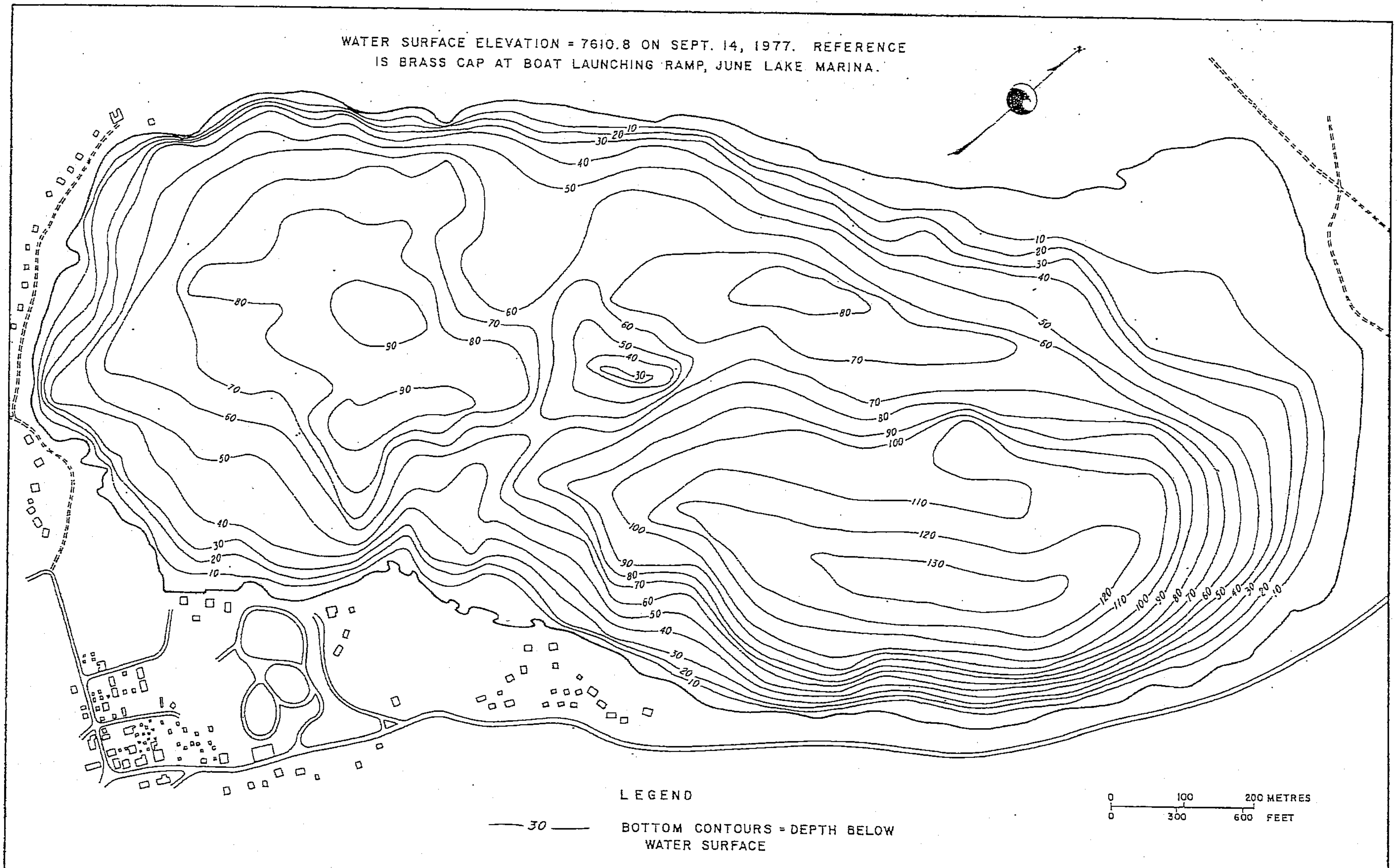


Figure 5 - JUNE LAKE CHART OF DEPTH CONTOURS

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1981

TABLE 6
AREA-CAPACITY, VOLUMETRIC ESTIMATES

June Lake

Depth, in feet*	Area, in acres*	Volume in acre-feet*	Cumulative volume in acre-feet*
0	297.84		
		2791.21	17782.40
10	260.60		
		2518.66	14991.20
20	243.13		
		2362.19	12472.50
30	229.31		
		2199.85	10110.30
40	210.66		
		1975.67	7910.50
50	184.48		
		1682.96	5934.84
60	152.11		
		1349.48	4251.88
70	117.78		
		1011.85	2902.40
80	102.27		
		694.77	1890.55
90	58.06		
		494.96	1195.77
100	45.14		
		378.04	700.82
110	30.46		
		228.48	322.78
120	15.23		
		94.29	94.29
130	Last Contour Line		

Gull Lake

Depth, in feet*	Area, in acres*	Volume in acre-feet*	Cumulative volume in acre-feet*
0	67.21		2568.96
		637.41	
10	60.28		1931.55
		578.62	
20	55.45		1352.93
		524.93	
30	49.54		828.00
		445.60	
40	39.58		382.40
		281.20	
50	16.66		101.20
		101.20	
60	Last Contour Line		

Silver Lake

Depth, in feet*	Area, in acres*	Volume in acre-feet*	Cumulative volume in acre-feet*
0	112.07		3388.60
		966.07	
10	81.14		2414.53
		761.40	
20	71.14		1653.13
		657.39	
30	60.34		995.74
		527.38	
40	41.14		468.36
		340.84	
50	23.03		127.52
		127.52	
60	Last Contour Line		

*Feet x 0.3048 = metres Acres x 0.40469 = hectares Acre-feet x 1.2335 = cubic dekametres

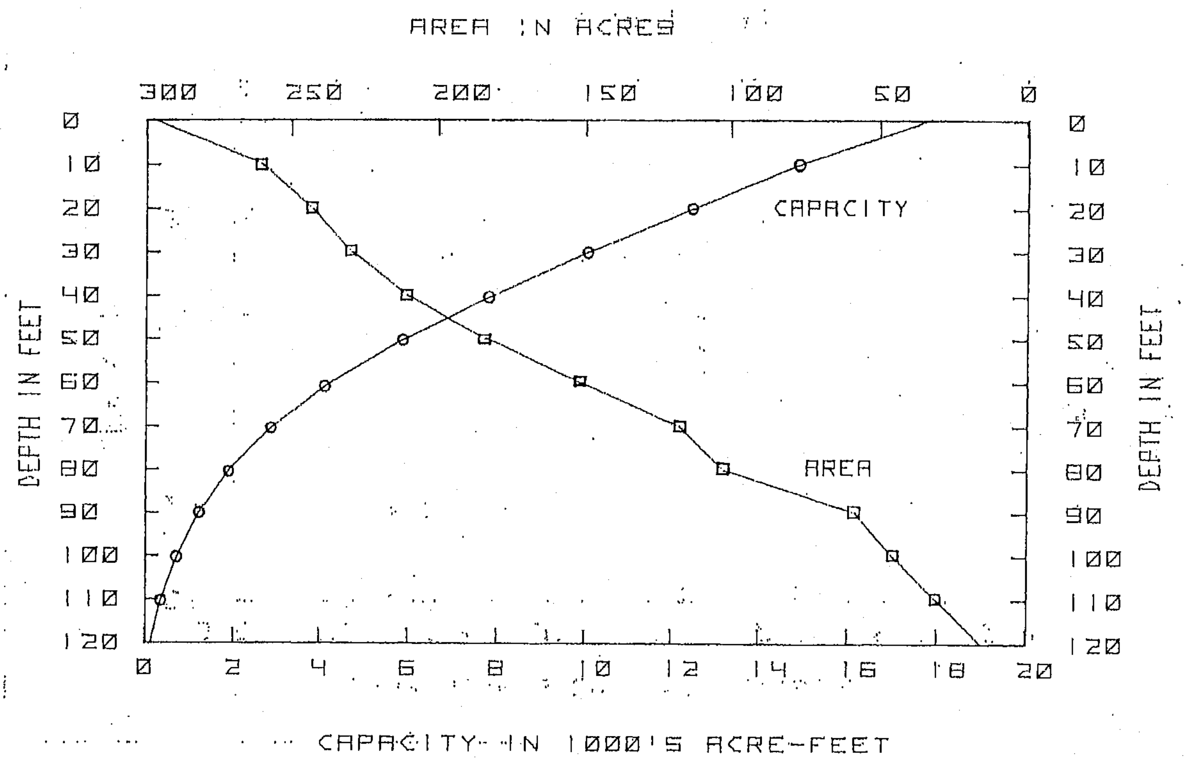


FIGURE 8- AREA-CAPACITY CURVE FOR JUNE LAKE

Appendix D

Wagner Bonsignore
Consulting Civil Engineers, A Corporation

Nicholas F. Bonsignore, P.E.
Robert C. Wagner, P.E.
Paula J. Whealen
Andrew T. Bambauer, P.E.
David M. Houston, P.E.
Ryan E. Stolfus

April 18, 2006

Mr. John Enloe
ECO:LOGIC
10381 Double R Blvd.
Reno, NV 89521

Re: June Lake, Rodeo Grounds Development, Fern Creek/Rush Creek Correlation Study

Dear John:

Pursuant to my email of January 20, 2006, this is to report our findings following an evaluation of daily flows for Fern Creek and Rush Creek near June Lake in Mono County. The purpose of the analysis was to assess whether a relationship exists between the flows of these two streams for the period of overlapping measured flow data. If there is a relationship, then the relatively long period of record for Rush Creek might be used as an index to estimate historical flows for Fern Creek under various historic hydrologic conditions.

Based on our evaluation, we did not identify a relationship between the two streams. The following describes our methodology and conclusions in greater detail.

SETTING

The subject watersheds are shown on the attached Plate I. Fern Creek originates near San Joaquin Mountain and flows northerly to Reversed Creek. June Lake Public Utility District (JLPUD) has a diversion facility on Fern Creek located about 2,000 feet upstream of the confluence with Reversed Creek. The watershed area above the JLPUD diversion is about 1,312 acres, with the highest elevation being about 11,600 feet.

Reversed Creek joins Rush Creek just upstream of Silver Lake. Upstream of this confluence on Rush Creek, Southern California Edison (SCE) operates a hydropower project that includes Waugh Lake (also known as Rush Meadows Lake), Gem Lake, and Agnew Lake. The watershed area of Rush Creek above Agnew Lake is about 14,200 acres (about 10 times that of Fern Creek), with the highest elevation being about 13,000 feet.

444 North Third Street, Suite 325, Sacramento, California 95814-0228
Ph: 916-441-6850 Fx: 916-448-3866

FERN CREEK FLOW RECORDS

A detailed description of flow measurements made by JLPUD at the Fern Creek diversion facility is provided in Section 5.1.2 of our draft Report dated October 21, 2005. To recap, since September 2004 JLPUD has operated a Cipolletti weir and stage recorder at its Fern Creek diversion facility capable of measuring bypassed flows up to about 0.75 MGD (about 1.16 cfs). Based on analysis of JLPUD records, Fern Creek bypass flows were within the accuracy range of the Cipolletti weir from September 4, 2004 to mid May 2005. Bypass flows were also sporadically within the accuracy range of the Cipolletti weir from August 21, 2005 to at least September 28, 2005. A totalizing meter at JLPUD's Clark Water Treatment Plant provides information on the amount of water diverted from Fern Creek upstream of the bypass weir. The sum of the bypassed flow and the diverted volume provides a measure of the unimpaired flow of Fern Creek above the diversion facility.

JLPUD recorded staff gage readings for the bypass on an approximate weekly basis beginning in September 2004, subject to access conditions. Meter readings for diverted amounts are available on a daily basis. Our evaluation of the data resulted in estimates of daily unimpaired flow for Fern Creek for the period of early September 2004 to early May 2005, and for late August to late September 2005 (presented in Figure 4 in our October 2005 Report). This data is re-plotted in a different format on Figure 1 herein (in blue). In general, Fern Creek flows declined from around 0.77 cfs in mid-October 2004, to about 0.16 cfs in late March 2005. Flows increased substantially in April 2005, likely as a result of melting snow. Day-to-day fluctuations of as much as 40 percent in the estimated Fern Creek flow during the low-flow period suggest that either 1) the methodology used does not accurately model day-to-day flows, or 2) the flow of Fern Creek cycles naturally, perhaps in response to freeze-thaw conditions. This daily variance in estimated flow is not observed in the August and September 2005 data to the same degree as the earlier data.

SCE RUSH CREEK FLOW RECORDS

SCE provided daily operational data for its Rush Creek hydropower project on a monthly basis for July 2004 through October 2005. SCE's monthly reports are provided in Appendix A hereto. It is noted that all of the reports indicate that the data is "preliminary" and "subject to revision." In addition to other operational data, SCE reports the estimated natural flow of Rush Creek that would occur absent the hydropower project. The natural flow value is *computed* on a daily basis and, as can be seen in some of the reports, is sometimes computed to be a negative value, which of course is physically impossible. SCE attributes the negative values to errors in the Gem Lake and Rush Meadows Lake capacity tables. For our evaluation, we assumed that all negative values of Rush Creek flow were "zero".

A plot of estimated daily Rush Creek natural flow is provided on Figure 1 (in pink). As shown, Rush Creek flows generally varied between zero and 40 cfs from September 2004 through mid April 2005. Beginning in late April, flows increased dramatically and were in excess of 200 cfs throughout the late spring and early summer, with peak flows in excess of 500 cfs. Similar to the Fern Creek data, the fluctuation in daily flow during the low-flow period calls into question the accuracy of the data.

COMPARISON OF DAILY FLOW DATA

It is noted that the plots of daily flow data for the two streams shown on Figure 1 are at different scales. In general, Rush Creek flows are 1 to 2 orders of magnitude greater than Fern Creek flows, therefore the use of different scales is required to visually assess similarities. We did not discern any particular relationship between the two records for the low flow season (generally September through March). While Fern Creek flows tend to decline over this period, Rush Creek flows fluctuate with no particular pattern. Both records show an increase in flow beginning around early April. There is a gap in the Fern Creek record over most of the late spring and summer of 2005. The pattern of the Fern Creek flow record for late August and September 2005 does not match the Rush Creek flow record for those months particularly well.

We also compared the two records statistically. Figure 2 is a "scatter graph" of all available daily flows for the two records, excluding the negative flow days from the Rush Creek data. While there are some very general tendencies, the correlation is not good, as exemplified by the very low value of the coefficient of determination (R^2) of about 0.02.

We also looked for statistical relationships on a monthly basis. Figures 3 through 13 show scatter graphs for each month of available data between September 2004 and September 2005. These graphs also show the best fit line and coefficient of determination. None of the months correlate well, with many of the months having an R^2 below 0.1. The highest R^2 is for August 2005, and is somewhat counter-intuitive in that the correlation is negative, i.e. Fern Creek flows decrease as Rush Creek flows increase.

CONCLUSIONS

It does not appear that SCE's estimate of daily natural Rush Creek flows provides a suitable index for estimating historical Fern Creek flows. Reasons for the lack of correlation may be due to one or a combination of the following:

- The accumulation of error in the determination of daily flows for each source. The Fern Creek flow data relies on two distinct measurements of flow, one for the bypass (the Cipoletti weir), and the other for the diversion (the Clark Water Treatment Plant meter).

The bypass measuring device is not read daily therefore daily flows between readings must be inferred.

SCE's daily Rush Creek flow data is calculated based on measurement of other parameters including reservoir capacity (which itself is obtained indirectly by reading a staff gage and referring to a stage-capacity curve for each of three reservoirs), pipe flow through the power house, and streamflows below Agnew Lake by way of a weir. All of these measurements introduce a certain degree of error, and all of the error is reckoned in the computed flow value (which accounts for the negative values).

- Related to the foregoing, the relative sizes of the two flows may be incompatible for purposes of comparison. The Rush Creek data is 1 to 2 orders of magnitude greater then the Fern Creek data, therefore reasonable errors in Rush Creek data may be near or greater than Fern Creek flows. For example on March 12, 2005, Rush Creek flow was 15.47 cfs. A 1 percent error in this measurement would be about 0.15 cfs. The flow at Fern Creek on March 12, 2005, was about 0.16 cfs. Accordingly, the Rush Creek data would need to be better than 99 percent accurate for comparing with Fern Creek flows.

- The watersheds may be too different physically, and regardless of whether the measurements are accurate, there may actually be no relationship between the two.

I trust the foregoing satisfactorily addresses this issue. Please call me if you have any questions.

Very truly yours,

WAGNER & BONSIGNORE
CONSULTING CIVIL ENGINEERS

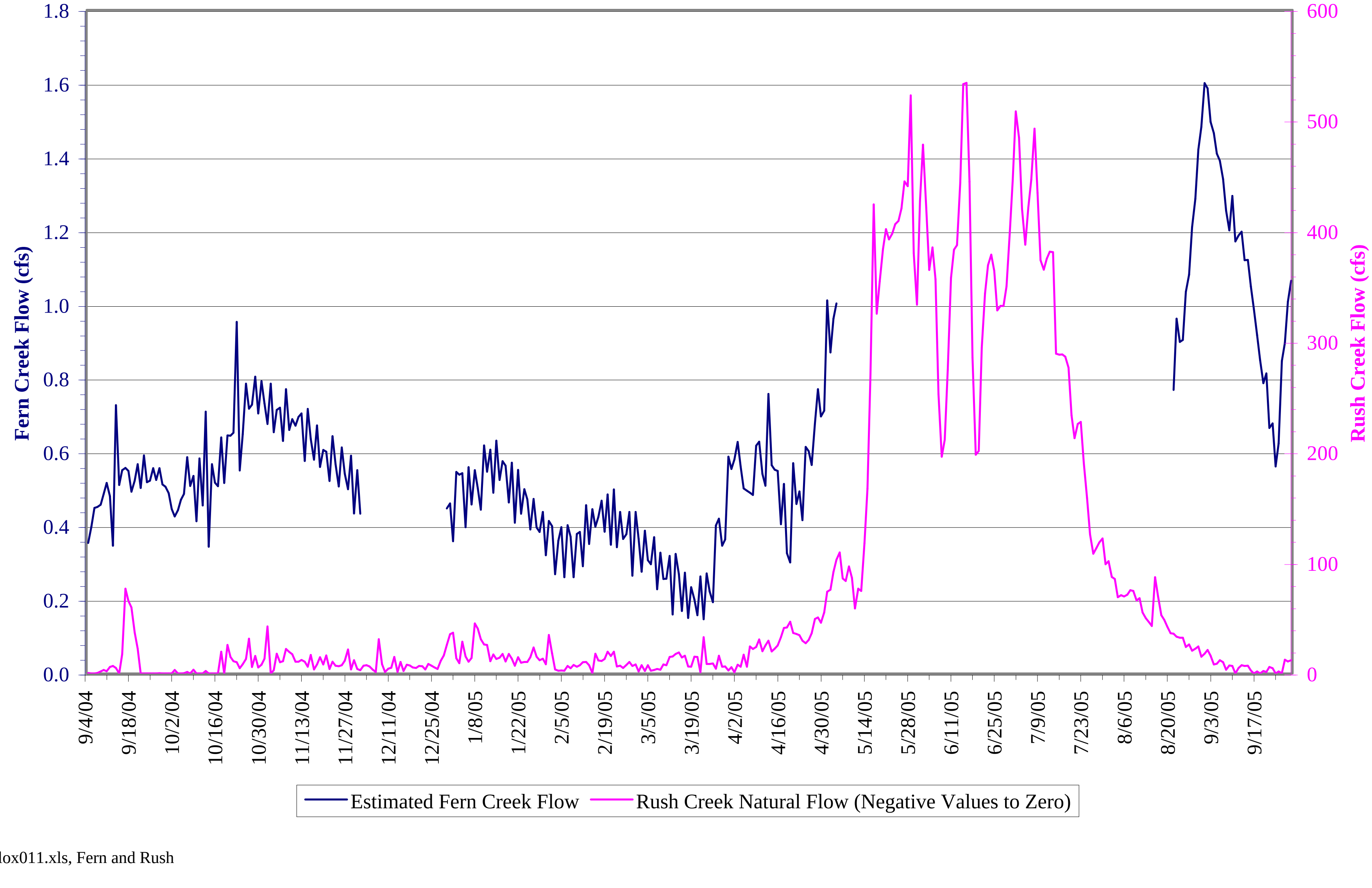
Nick

Nicholas F. Bonsignore, P.E.

ENLOB013.doc

FIGURE 1

Daily Estimated Fern Creek Flow and
Rush Creek Natural Flow (Negative Values Assumed to be Zero)
September 2004 through September 2005



enlox011.xls, Fern and Rush

FIGURE 2

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
September 2004 Through September 2005 (Negative Values Omitted)

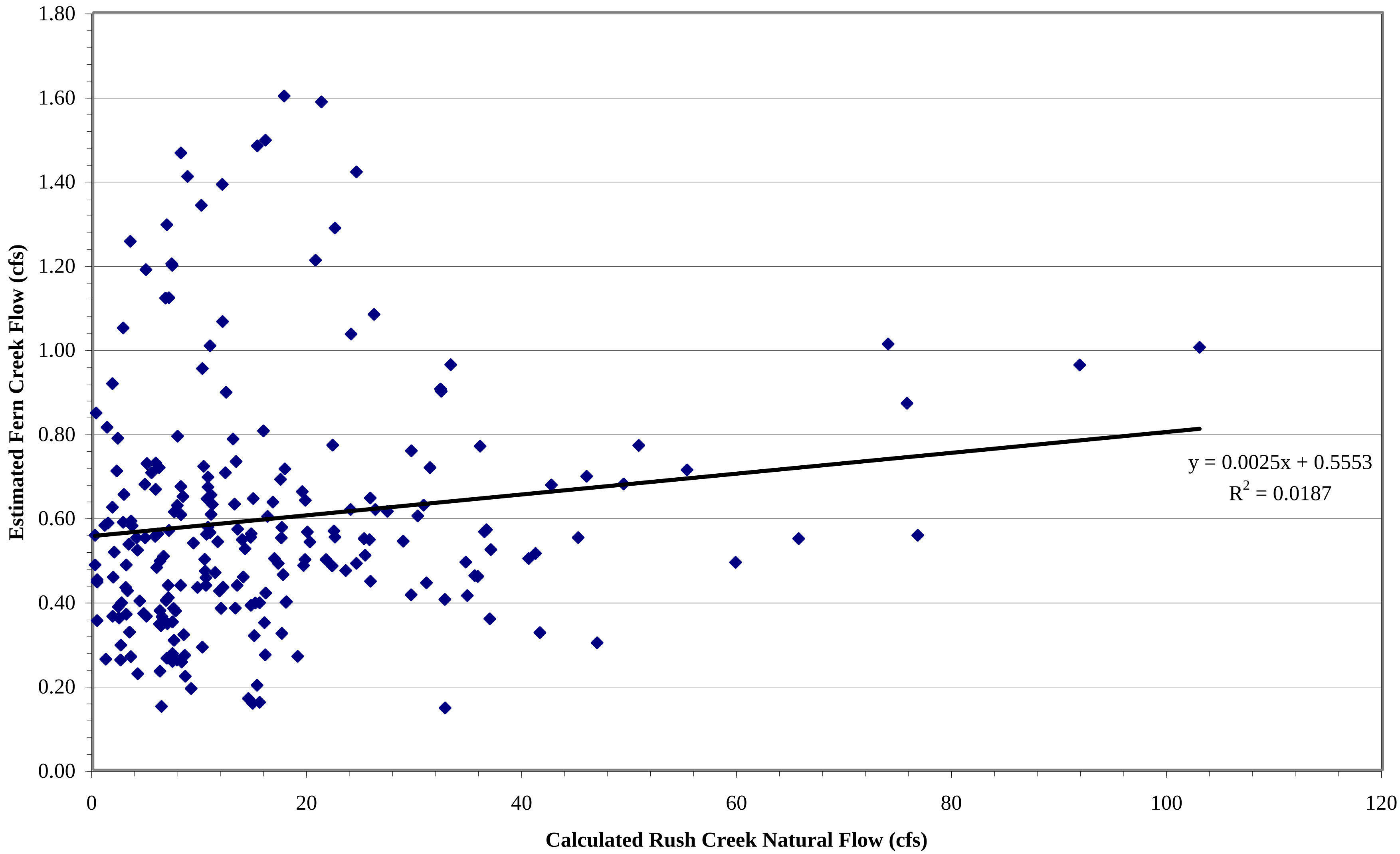


FIGURE 3

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for September 2004 Omitting Negative Calculated Rush Creek Flow

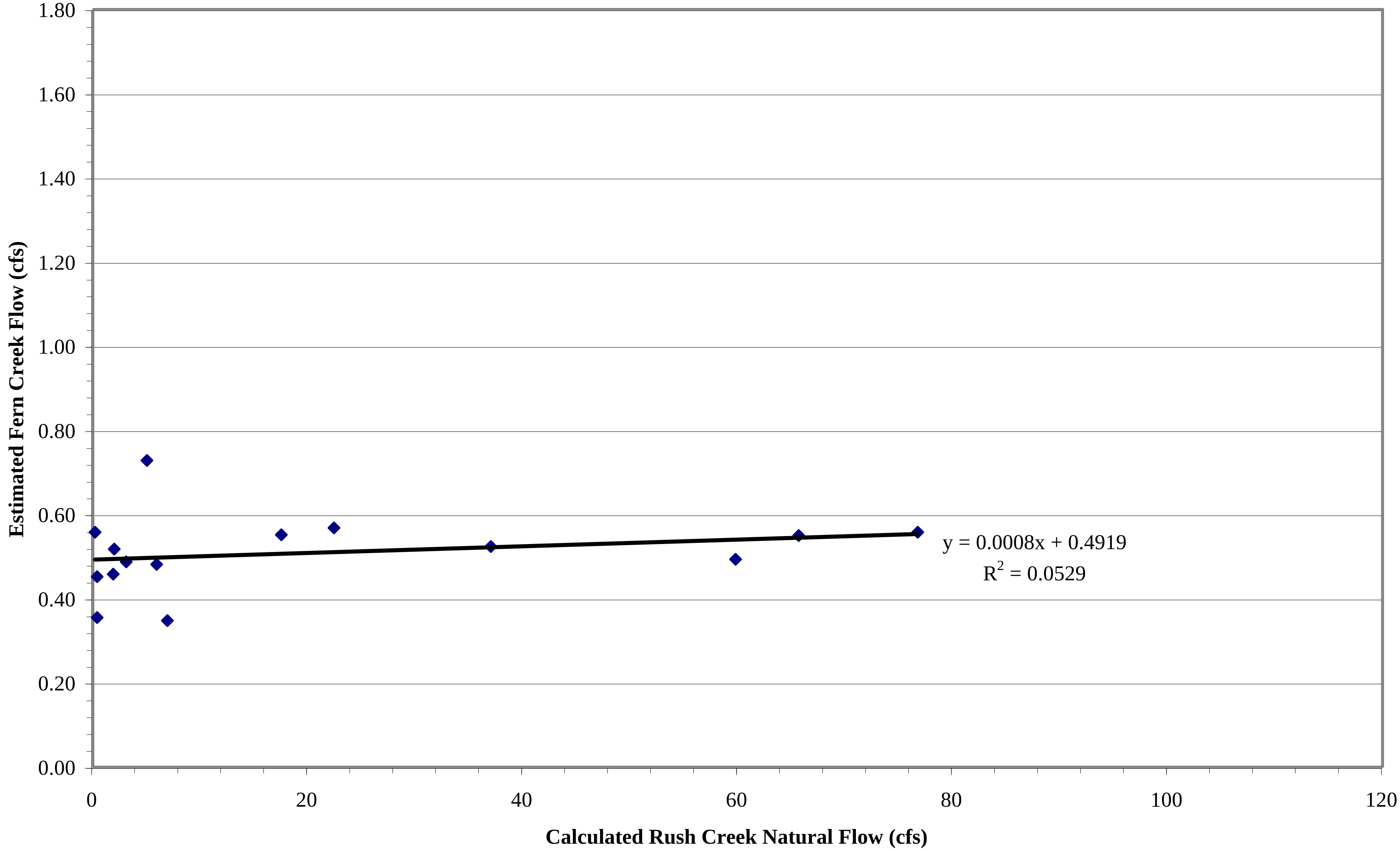


FIGURE 4

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for October 2004 Omitting Negative Calculated Rush Creek Flows

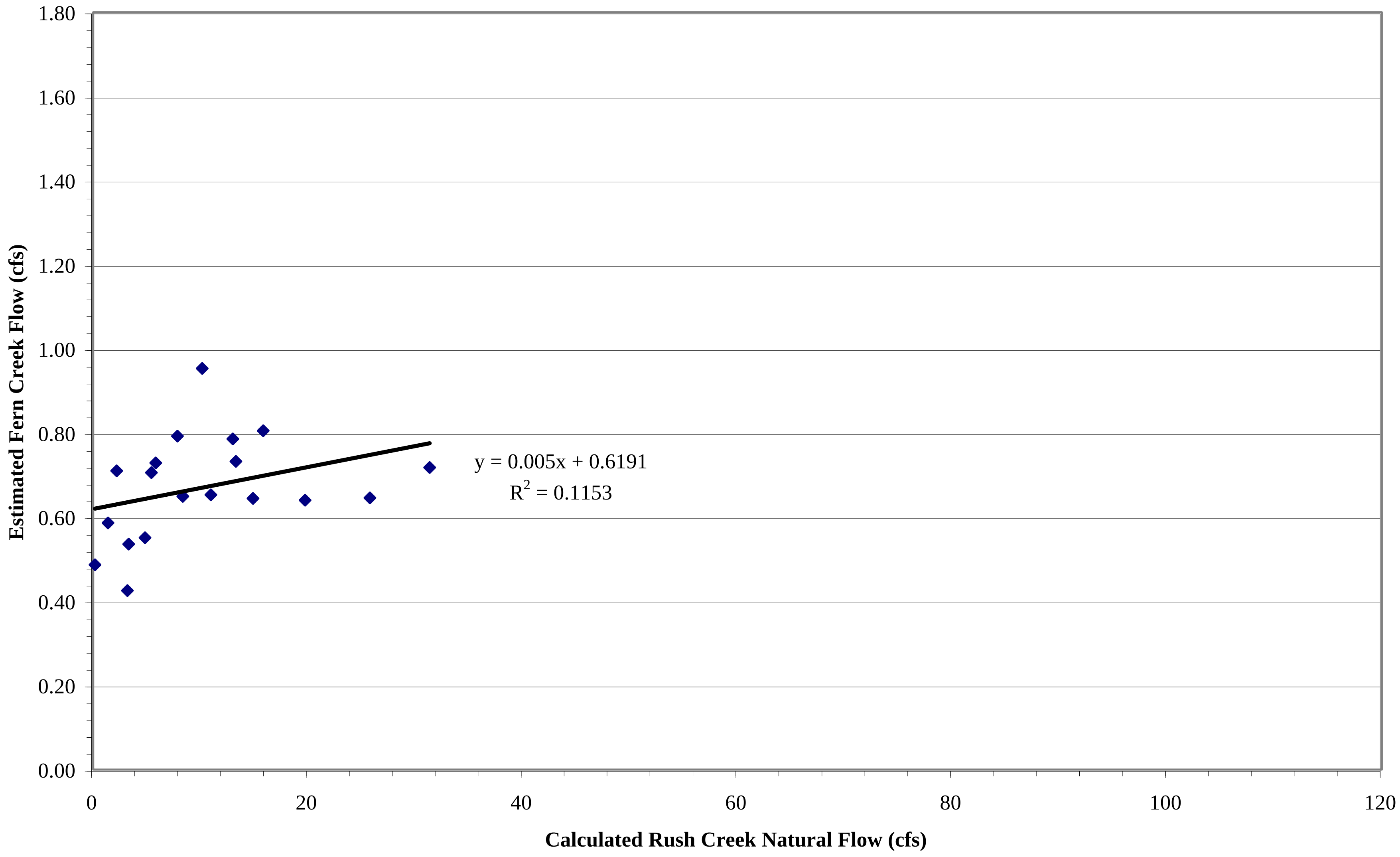


FIGURE 5

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for November 2004 Omitting Negative Calculated Rush Creek Flows

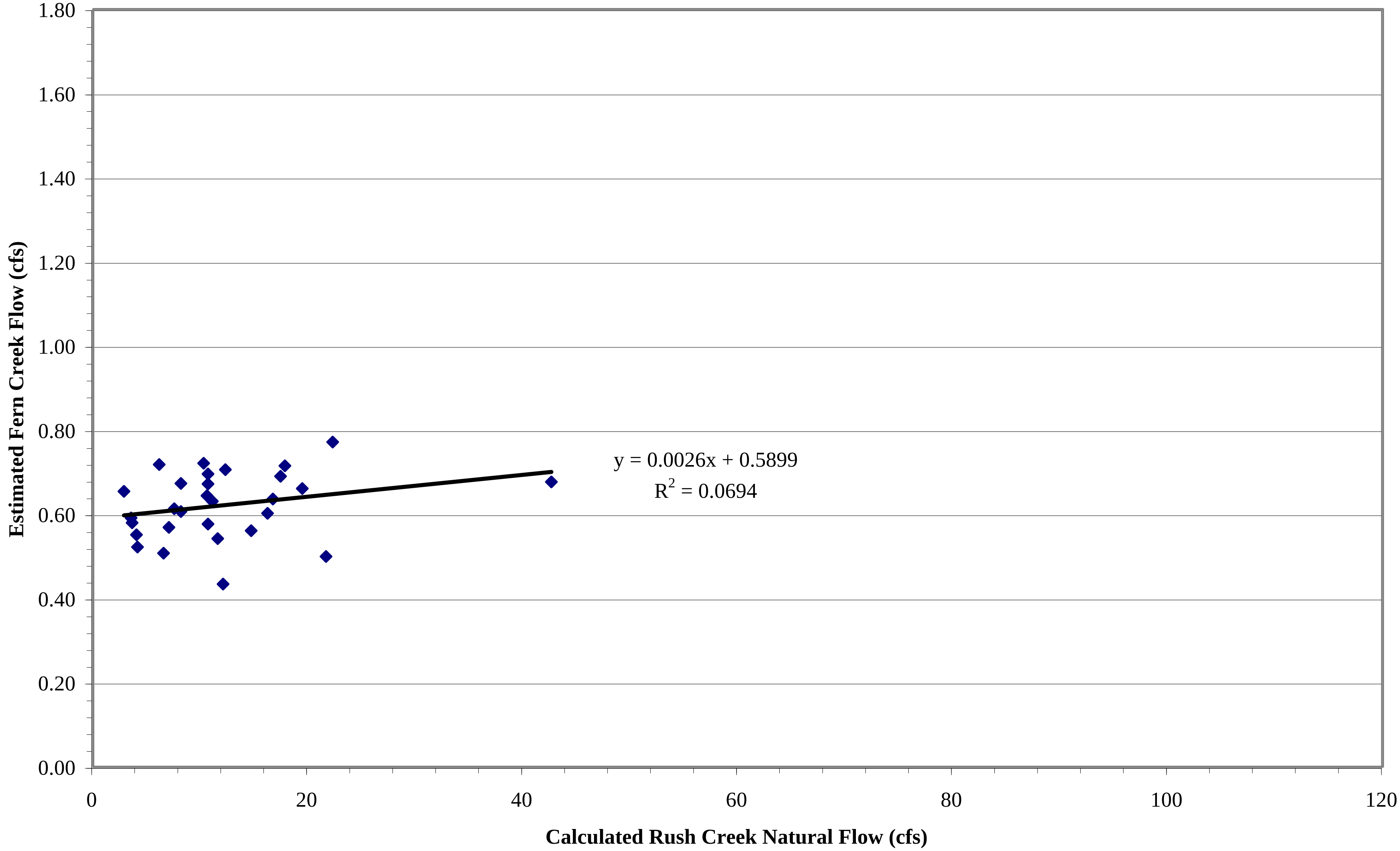


FIGURE 6

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for December 2004 Omitting Negative Calculated Rush Creek Flows

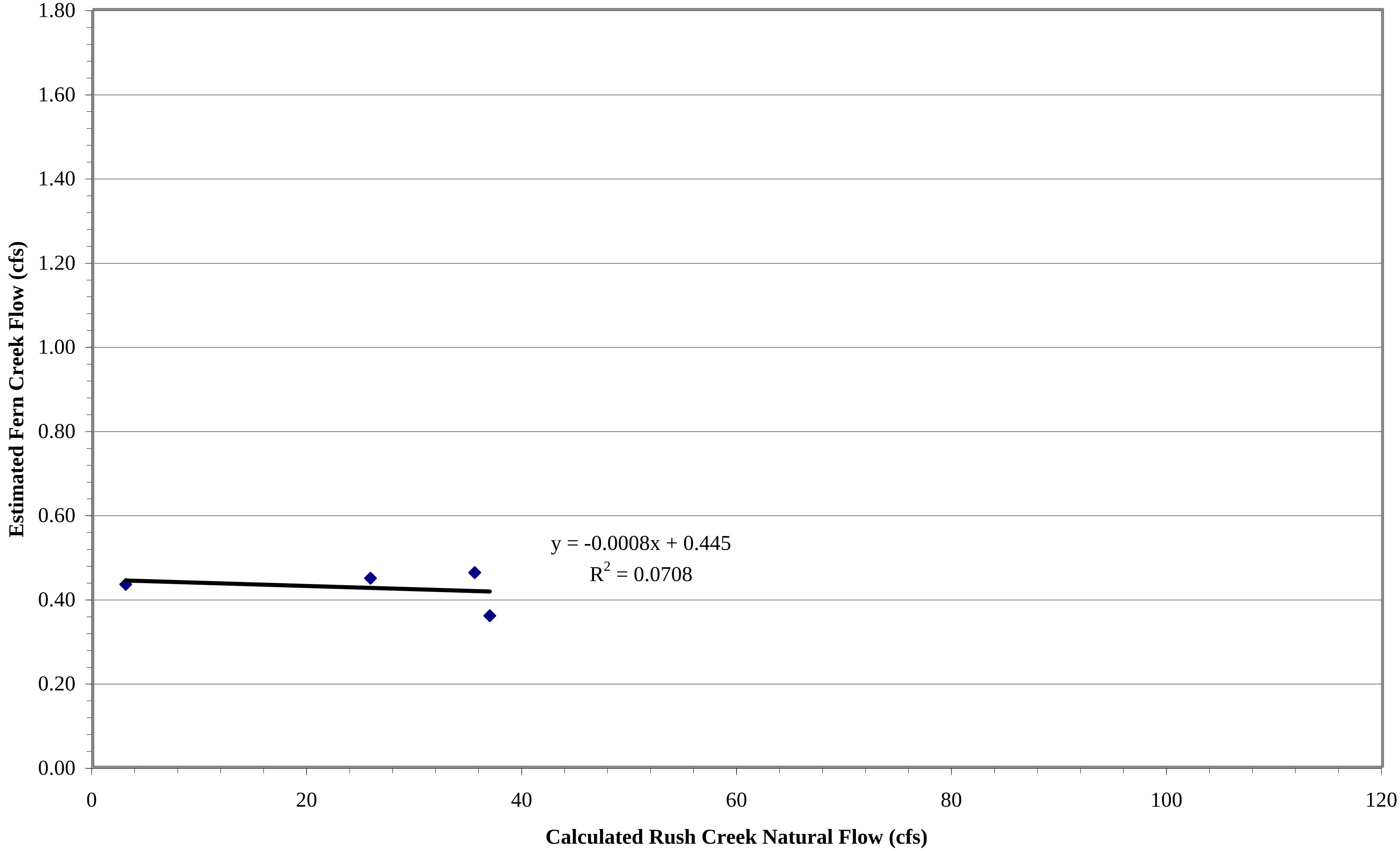


FIGURE 7

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for January 2005 Omitting Negative Calculated Rush Creek Flows

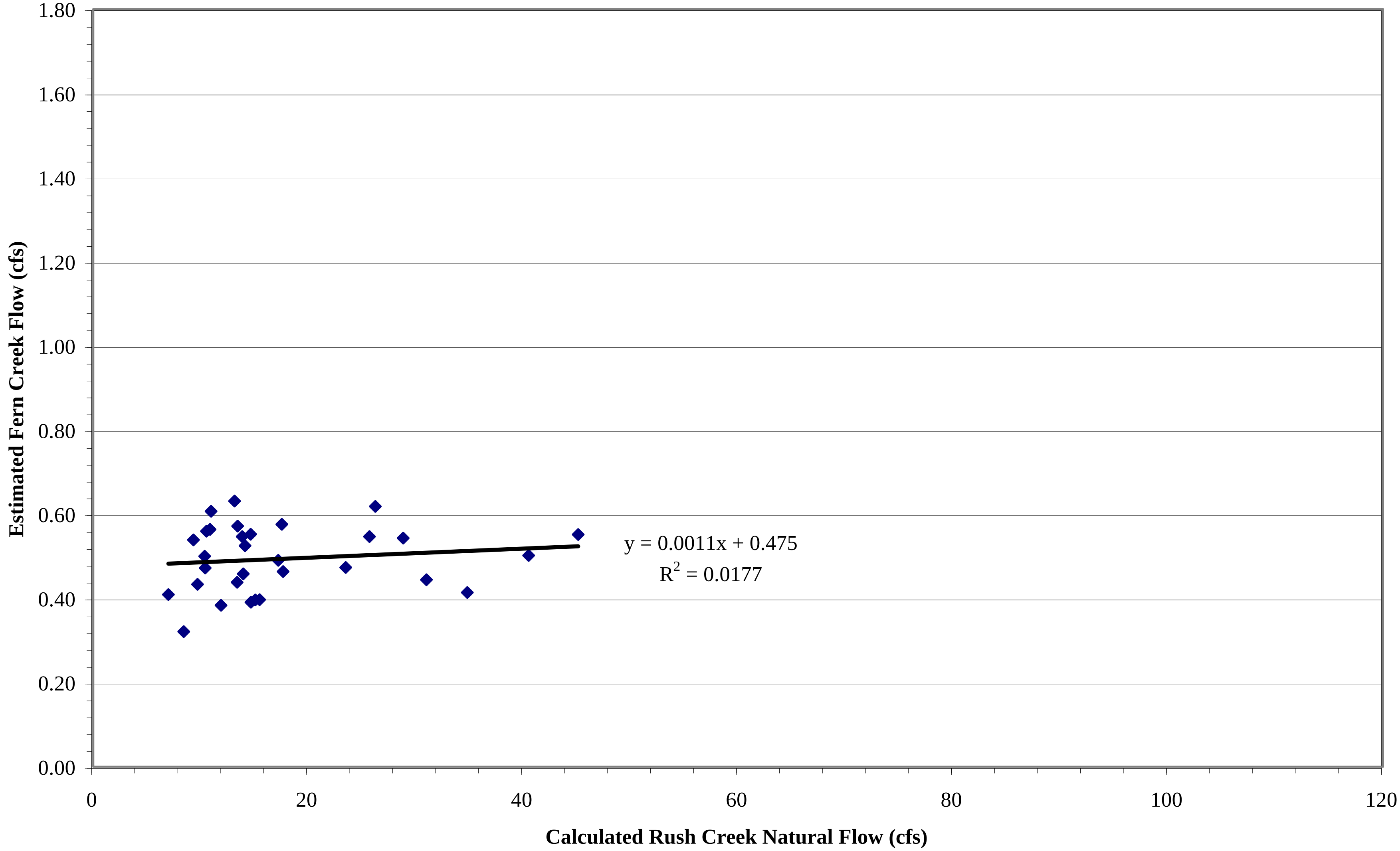


FIGURE 8

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for February 2005 Omitting Negative Calculated Rush Creek Flows

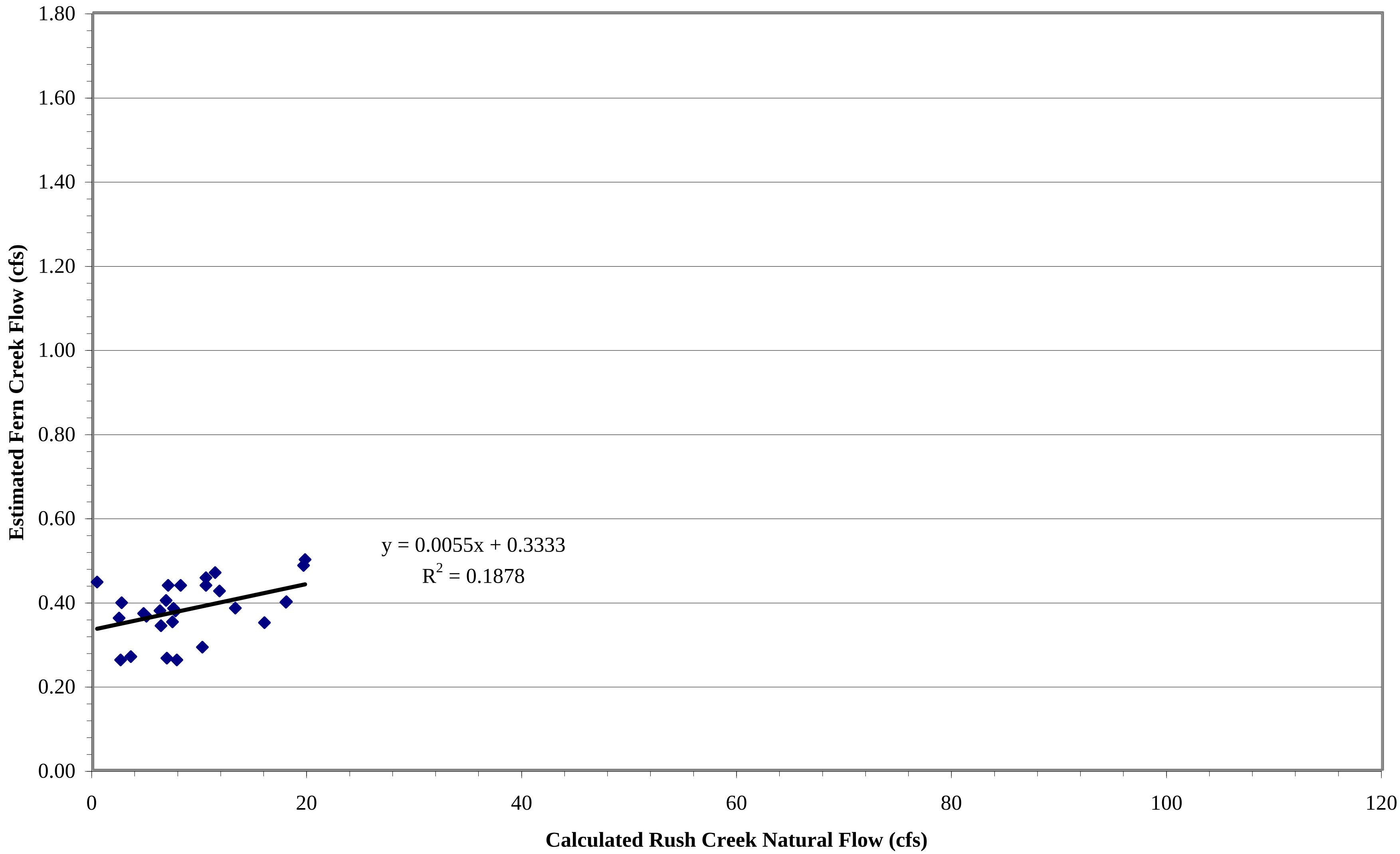


FIGURE 9

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for March 2005 Omitting Negative Calculated Rush Creek Flows

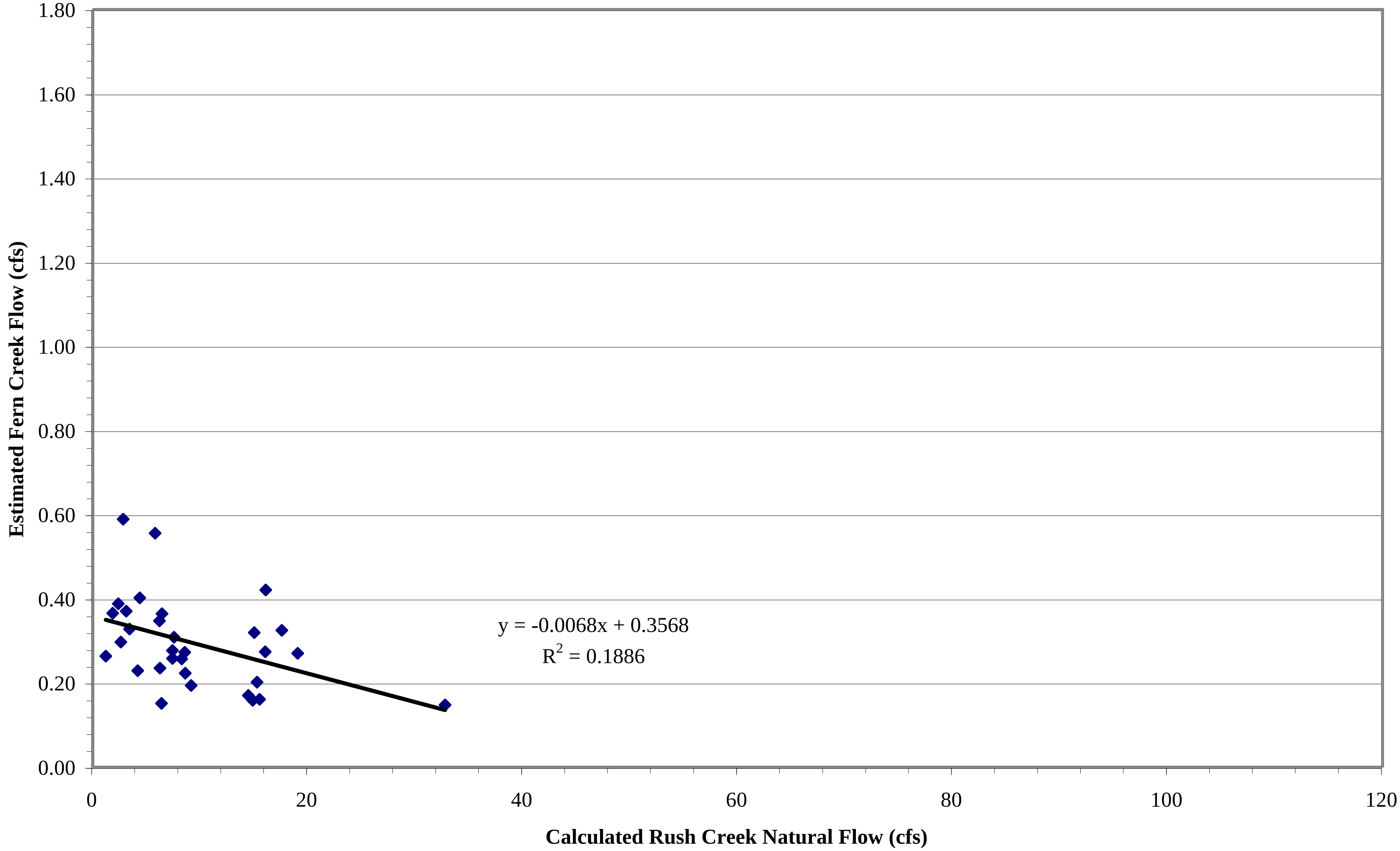


FIGURE 10

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for April 2005 Omitting Negative Calculated Rush Creek Flows

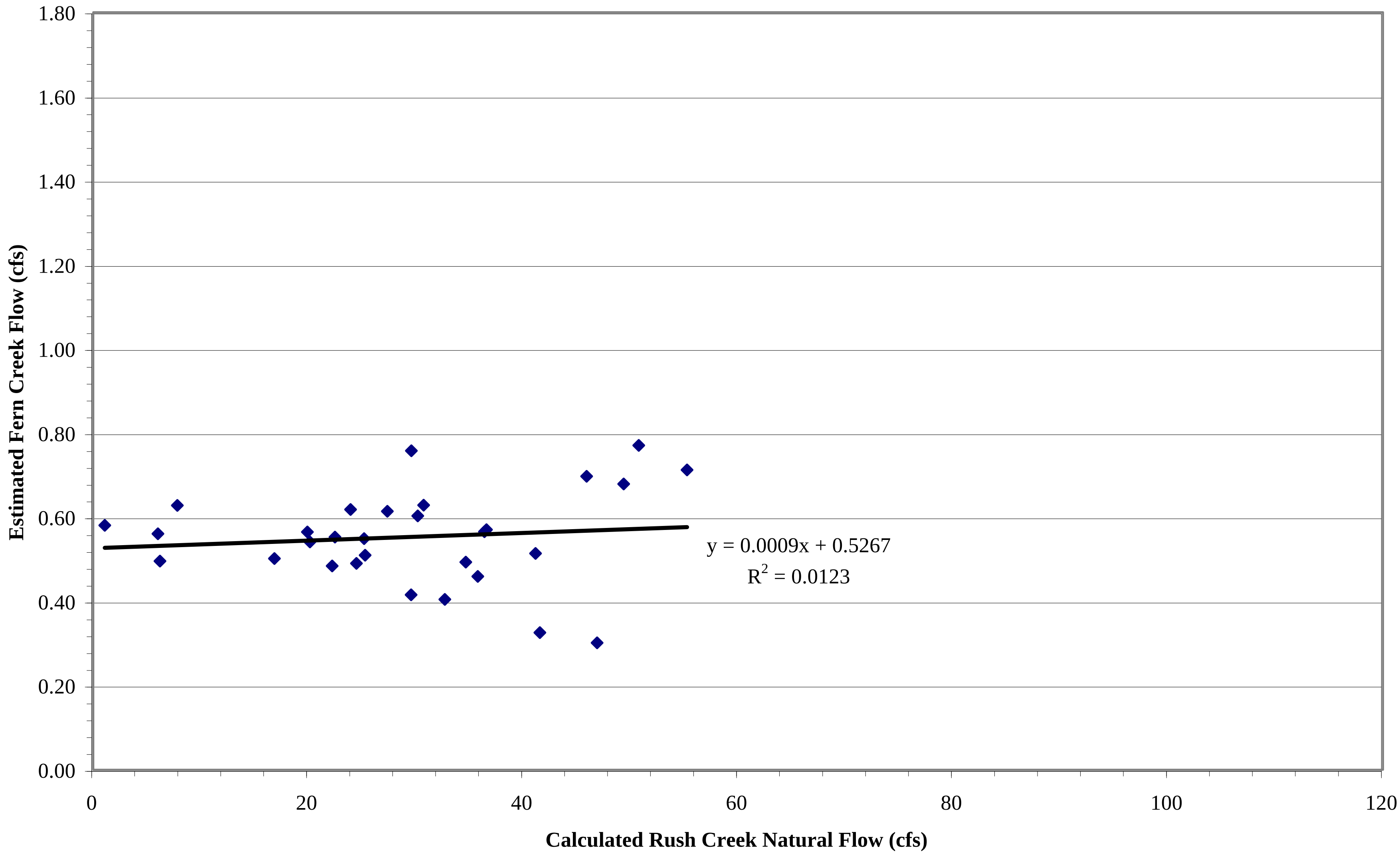


FIGURE 11

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for May 2005 Omitting Negative Calculated Rush Creek Flows

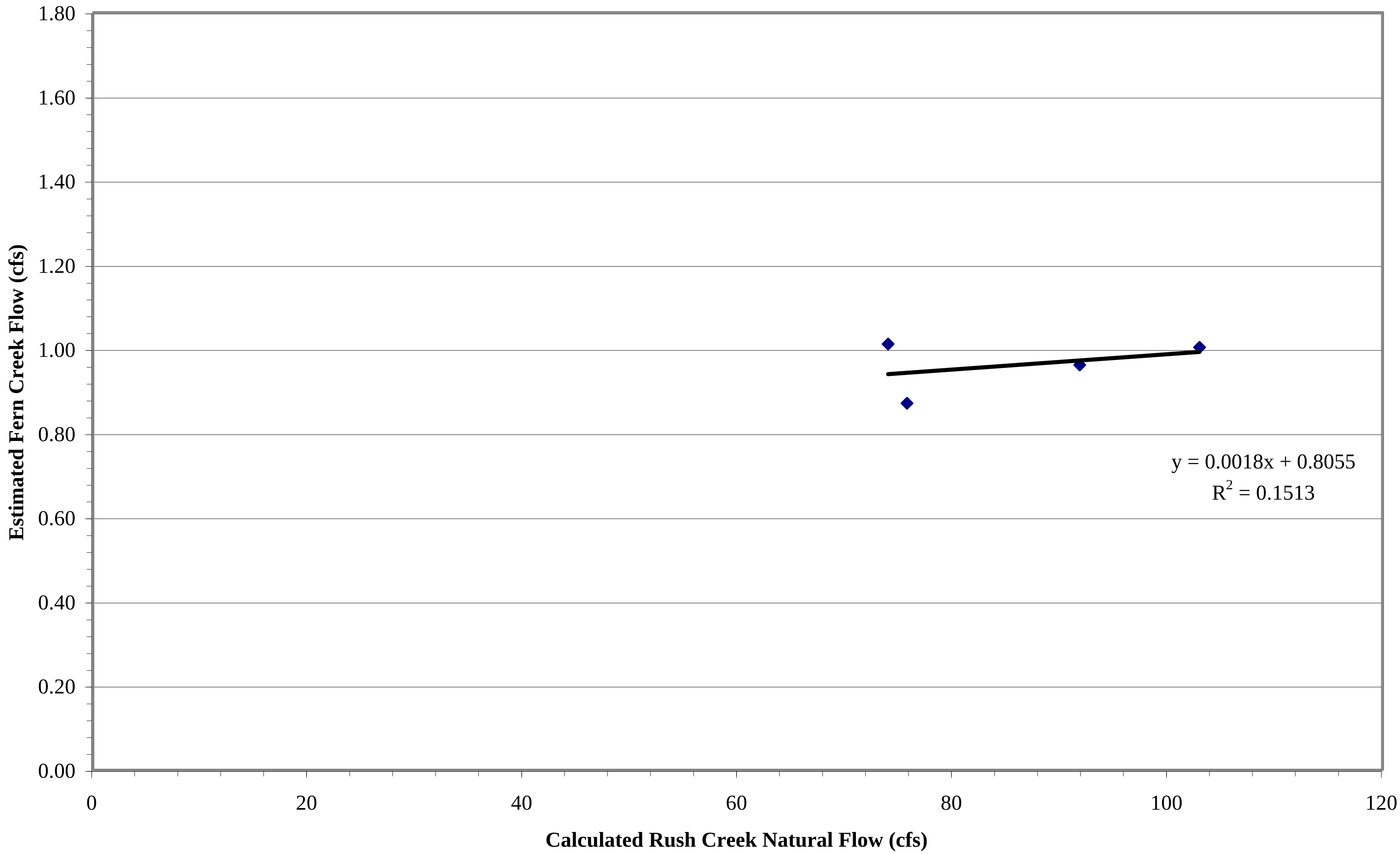


FIGURE 12

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for August 2005 Omitting Negative Calculated Rush Creek Flows

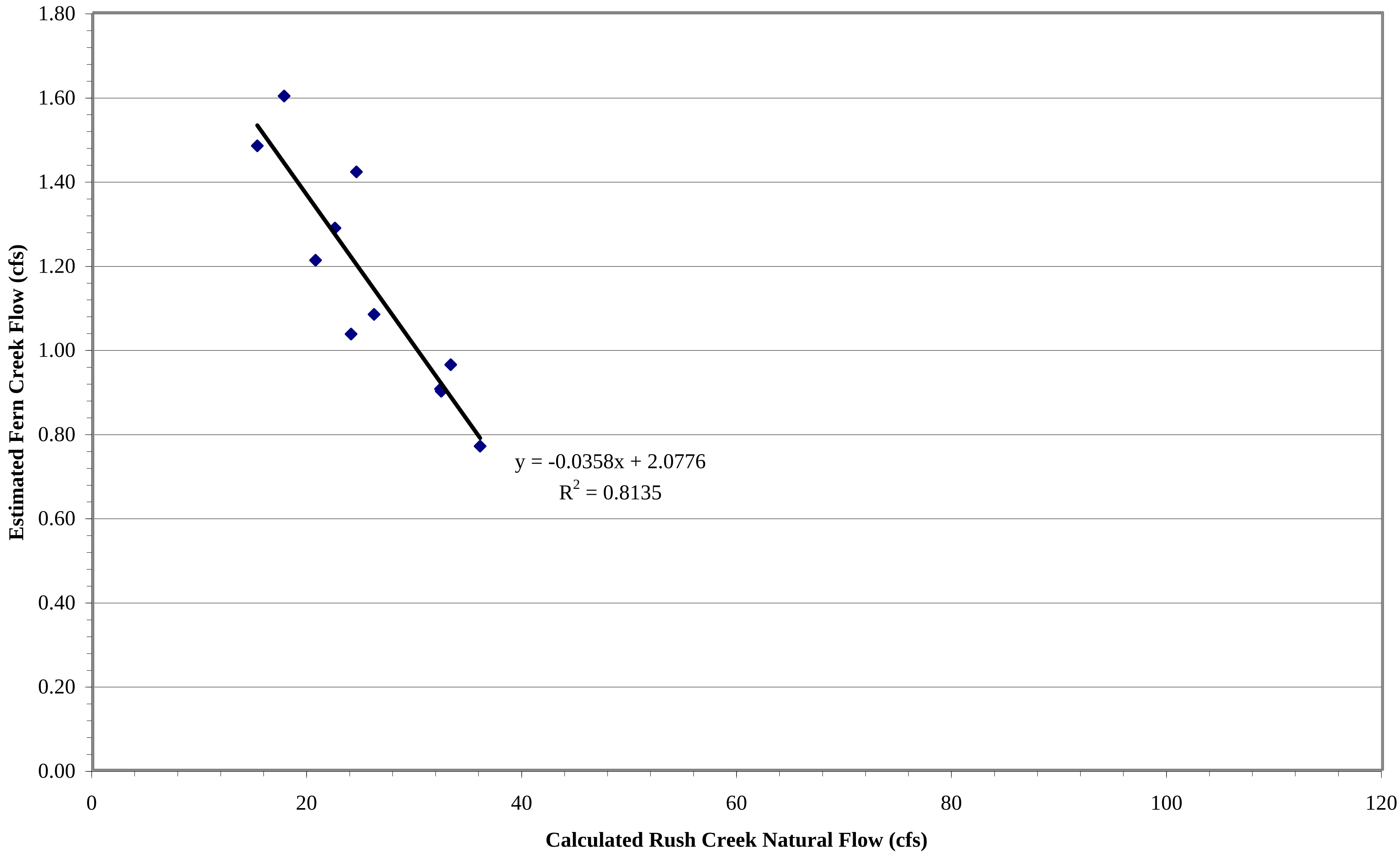


FIGURE 13

Comparison Between Estimated Fern Creek Flows and Calculated Rush Creek Natural Flow
Daily Flow for September 2005 Omitting Negative Calculated Rush Creek Flows

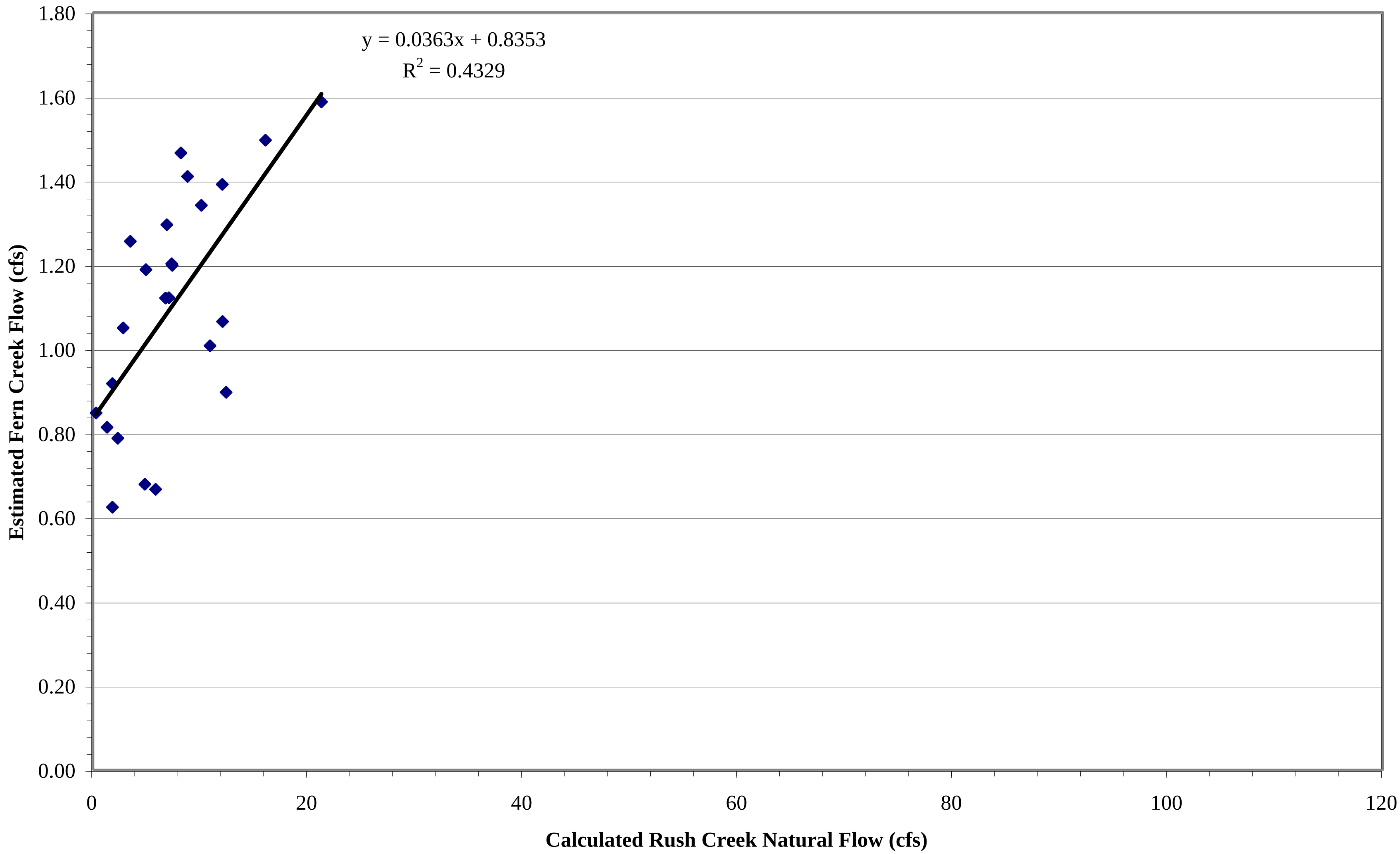


PLATE I

Map Showing
Appoximate Watershed Boundaries
of
Rush Creek and Fern Creek

Mono County

Wagner & Bonsignore
Consulting Civil Engineers, A Corporation

Base Map Per USGS 7.5 Minute Quad Maps for Koip Peak, June Lake, Mammoth Mt., Mt. Lyell, Mt. Ritter and Vogelsang Peak.

April 2006

APPENDIX A

SCE Monthly Operational Reports

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF July — 2004 — W.Y. 2004

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	22975	5340	-9	16820	81	815	1	36.8	15.8	52.6	12.0	3.8	
2	22997	5340	0	16842	22	815	0	11.1	42.3	53.4	38.0	4.3	
3	23001	5349	9	16837	-5	815	0	2.0	58.8	60.8	54.0	4.8	
4	22992	5351	2	16826	-11	815	0	-4.5	58.4	53.9	54.0	4.4	
5	23014	5362	11	16837	11	815	0	11.1	57.6	68.7	54.0	3.6	
6	23044	5366	4	16862	25	816	1	15.1	57.9	73.0	54.0	3.9	
7	23069	5360	-6	16898	36	811	-5	12.6	59.6	72.2	54.0	5.6	
8	23024	5353	-7	16862	-36	809	-2	-22.7	84.4	61.7	80.0	4.4	
9	22922	5342	-11	16773	-89	807	-2	-51.4	96.6	45.2	92.0	4.6	
10	22845	5334	-8	16705	-68	806	-1	-38.8	75.7	36.9	72.0	3.7	
11	22807	5325	-9	16677	-28	805	-1	-19.2	51.4	32.2	48.0	3.4	
12	22732	5316	-9	16613	-64	803	-2	-37.8	68.9	31.1	65.0	3.9	
13	22672	5323	7	16548	-65	801	-2	-30.3	63.9	33.6	60.0	3.9	
14	22710	5325	2	16585	37	800	-1	19.2	19.2	38.4	16.0	3.2	
15	22743	5325	0	16618	33	800	0	16.6	19.0	35.6	16.0	3.0	
16	22790	5329	4	16660	42	801	1	23.7	19.0	42.7	16.0	3.0	
17	22842	5332	3	16708	48	802	1	26.2	19.0	45.2	16.0	3.0	
18	22891	5330	-2	16759	51	802	0	24.7	19.1	43.8	16.0	3.1	
19	22922	5325	-5	16795	36	802	0	15.6	19.0	34.6	16.0	3.0	
20	22956	5321	-4	16834	39	801	-1	17.1	19.0	36.1	16.0	3.0	
21	22987	5317	-4	16868	34	802	1	15.6	19.0	34.6	16.0	3.0	
22	23006	5314	-3	16890	22	802	0	9.6	19.0	28.6	16.0	3.0	
23	23026	5312	-2	16912	22	802	0	10.1	19.0	29.1	16.0	3.0	
24	23046	5308	-4	16935	23	803	1	10.1	19.0	29.1	16.0	3.0	
25	23052	5304	-4	16946	11	802	-1	3.0	19.0	22.0	16.0	3.0	
26	22989	5301	-3	16887	-59	801	-1	-31.8	49.0	17.2	46.0	3.0	
27	22863	5295	-6	16767	-120	801	0	-63.5	82.0	18.5	79.0	3.0	
28	22718	5290	-5	16627	-140	801	0	-73.1	85.0	11.9	82.0	3.0	
29	22564	5284	-6	16481	-146	799	-2	-77.6	86.1	8.5	83.0	3.1	
30	22400	5278	-6	16324	-157	798	-1	-82.7	87.0	4.3	84.0	3.0	
31	22239	5271	-7	16171	-153	797	-1	-81.17	87.20	6.03	84.00	3.20	
TOTAL			-78		-568		-17	-334.26	1495.90	1161.64	1387.00	108.90	TOTAL
MEAN								-10.78	48.25	37.47	44.74	3.51	MEAN
MAX.								36.80	96.60	73.03	92.00	5.60	MAX
MIN.								-82.68	15.80	4.32	12.00	3.00	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2967

TOTAL NATURAL FLOW IN ACRE FEET 2304

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF AUGUST** **2004** **W.Y. 2004**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	22070	5258	-13	16017	-154	795	-2	-85.2	87.0	1.8	84.0	3.0	
2	21905	5247	-11	15863	-154	795	0	-83.2	87.0	3.8	84.0	3.0	
3	21732	5240	-7	15709	-154	783	-12	-87.2	87.5	0.3	85.0	2.5	
4	21564	5228	-12	15552	-157	784	1	-84.7	88.1	3.4	86.0	2.1	
5	21397	5221	-7	15392	-160	784	0	-84.2	88.1	3.9	86.0	2.1	
6	21223	5210	-11	15229	-163	784	0	-87.7	88.1	0.4	86.0	2.1	
7	21049	5201	-9	15064	-165	784	0	-87.7	88.1	0.4	86.0	2.1	
8	20875	5190	-11	14900	-164	785	1	-87.7	88.1	0.4	86.0	2.1	
9	20702	5182	-8	14735	-165	785	0	-87.2	88.1	0.9	86.0	2.1	
10	20528	5173	-9	14569	-166	786	1	-87.7	88.0	0.3	86.0	2.0	
11	20393	5164	-9	14443	-126	786	0	-68.1	69.8	1.7	68.0	1.8	
12	20285	5158	-6	14341	-102	786	0	-54.5	61.8	7.3	60.0	1.8	
13	20151	5155	-3	14208	-133	788	2	-67.6	73.8	6.2	72.0	1.8	
14	20096	5155	0	14152	-56	789	1	-27.7	37.8	10.1	36.0	1.8	
15	20077	5157	2	14130	-22	790	1	-9.6	23.9	14.3	22.0	1.9	
16	20066	5158	1	14117	-13	791	1	-5.5	18.1	12.6	16.0	2.1	
17	20049	5155	-3	14103	-14	791	0	-8.6	15.1	6.5	13.0	2.1	
18	20031	5149	-6	14090	-13	792	1	-9.1	16.1	7.0	14.0	2.1	
19	20031	5146	-3	14090	0	795	3	0.0	16.1	16.1	14.0	2.1	
20	20157	5254	108	14106	16	797	2	63.5	16.1	79.6	14.0	2.1	
21	20223	5316	62	14109	3	798	1	33.3	16.1	49.4	14.0	2.1	
22	20247	5314	-2	14136	27	797	-1	12.1	16.5	28.6	14.0	2.5	
23	20271	5291	-23	14184	48	796	-1	12.1	16.2	28.3	14.0	2.2	
24	20267	5260	-31	14208	24	799	3	-2.0	16.1	14.1	14.0	2.1	
25	20249	5217	-43	14235	27	797	-2	-9.1	16.1	7.0	14.0	2.1	
26	20220	5147	-70	14278	43	795	-2	-14.6	15.1	0.5	13.0	2.1	
27	20198	5061	-86	14338	60	799	4	-11.1	16.1	5.0	14.0	2.1	
28	20176	4974	-87	14403	65	799	0	-11.1	16.1	5.0	14.0	2.1	
29	20154	4885	-89	14470	67	799	0	-11.1	16.1	5.0	14.0	2.1	
30	20130	4796	-89	14538	68	796	-3	-12.1	16.1	4.0	14.0	2.1	
31	20087	4661	-135	14631	93	795	-1	-21.7	16.1	-5.6	14.0	2.1	
TOTAL			-610		-1540		-2	-1085.0	1403.3	318.3	1337.0	66.3	TOTAL
MEAN								-35.0	45.3	10.3	43.1	2.1	MEAN
MAX.								63.5	88.1	79.6	86.0	3.0	MAX
MIN.								-87.7	15.1	-5.6	13.0	1.8	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2783

TOTAL NATURAL FLOW IN ACRE FEET 631

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF SEPTEMBER 2004 — W.Y. 2004

DATE	TOTAL STOR.	RUSH MEADOWS storage	RUSH MEADOWS gain/loss	GEM LAKE storage	GEM LAKE gain/loss	AGNEW LAKE storage	AGNEW LAKE gain/loss	TOTAL +/- IN CFS	TOTAL CFS ACTUAL	TOTAL CFS NATURAL	FLOW THRU R.C.PLANT	AGNEW WEIR	REMARKS
1	20023	4494	-167	14733	102	796	1	-32.3	18.3	-14.0	16.0	2.3	Natural flows estimated
2	19956	4330	-164	14829	96	797	1	-33.8	31.8	-2.0	29.0	2.8	due to errors in storage
3	19888	4166	-164	14922	93	800	3	-34.3	31.0	-3.3	29.0	2.0	capacity tables between
4	19827	4009	-157	15019	97	799	-1	-30.8	31.1	0.3	29.0	2.1	Gem and R.M. Reservoirs
5	19764	3849	-160	15115	96	800	1	-31.8	31.1	-0.7	29.0	2.1	
6	19701	3689	-160	15211	96	801	1	-31.8	31.1	-0.7	29.0	2.1	
7	19640	3532	-157	15307	96	801	0	-30.8	31.1	0.3	29.0	2.1	
8	19582	3376	-156	15404	97	802	1	-29.2	31.1	1.9	29.0	2.1	
9	19526	3225	-151	15500	96	801	-1	-28.2	31.3	3.1	29.0	2.3	
10	19468	3071	-154	15596	96	801	0	-29.2	31.2	2.0	29.0	2.2	
11	19418	2923	-148	15693	97	802	1	-25.2	31.1	5.9	29.0	2.1	
12	19368	2778	-145	15789	96	801	-1	-25.2	32.1	6.9	29.0	3.1	
13	19316	2631	-147	15885	96	800	-1	-26.2	31.2	5.0	29.0	2.2	
14	19181	2400	-231	15981	96	800	0	-68.1	31.1	-37.0	29.0	2.1	
15	19154	2160	-240	16202	221	792	-8	-13.6	31.1	17.5	29.0	2.1	
16	19203	1919	-241	16495	293	789	-3	24.7	52.0	76.7	50.0	2.0	
17	19186	1679	-240	16719	224	788	-1	-8.6	74.2	65.6	72.0	2.2	
18	19151	1449	-230	16915	196	787	-1	-17.6	77.4	59.8	72.0	5.4	
19	19076	1229	-220	17061	146	786	-1	-37.8	74.8	37.0	72.0	2.8	
20	18956	1019	-210	17150	89	787	1	-60.5	82.9	22.4	81.0	1.9	
21	18710	819	-200	17103	-47	788	1	-124.0	91.0	-33.0	89.0	2.0	
22	18405	629	-190	16985	-118	791	3	-153.8	66.0	-87.8	64.0	2.0	
23	18135	440	-189	16904	-81	791	0	-136.1	39.0	-97.1	37.0	2.0	
24	17909	289	-151	16829	-75	791	0	-113.9	39.0	-74.9	37.0	2.0	
25	17665	119	-170	16753	-76	793	2	-123.0	39.0	-84.0	37.0	2.0	
26	17462	0	-119	16669	-84	793	0	-102.3	39.0	-63.3	37.0	2.0	
27	17383	0	0	16590	-79	793	0	-39.8	40.0	0.2	38.0	2.0	
28	17299	0	0	16506	-84	793	0	-42.4	40.0	-2.4	38.0	2.0	
29	17218	0	0	16422	-84	796	3	-40.8	40.0	-0.8	38.0	2.0	
30	17137	0	0	16341	-81	796	0	-40.8	40.1	-0.7	38.0	2.1	
31													
TOTAL			-4661		1710		1	-1487.29	1290.10	-197.19	1222.00	68.10	TOTAL
MEAN								-49.58	43.00	-6.57	40.73	2.27	MEAN
MAX.								24.70	91.00	76.70	89.00	5.40	MAX
MIN.								-153.77	18.30	-97.13	16.00	1.90	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2559

TOTAL NATURAL FLOW IN ACRE FEET 150 Estimated

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF OCTOBER** **2004** **W.Y. 2005**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	17054	0	0	16257	-84	797	1	-41.8	40.0	-1.8	38.0	2.0	
2	16981	0	0	16182	-75	799	2	-36.8	40.0	3.2	38.0	2.0	
3	16901	0	0	16102	-80	799	0	-40.3	40.0	-0.3	38.0	2.0	
4	16816	0	0	16017	-85	799	0	-42.9	40.0	-2.9	38.0	2.0	
5	16737	0	0	15937	-80	800	1	-39.8	40.0	0.2	38.0	2.0	
6	16660	0	0	15868	-69	792	-8	-38.8	40.2	1.4	38.0	2.2	
7	16572	0	0	15775	-93	797	5	-44.4	38.1	-6.3	36.0	2.1	
8	16499	0	0	15698	-77	801	4	-36.8	40.1	3.3	37.0	3.1	
9	16416	0	0	15619	-79	797	-4	-41.8	41.6	-0.2	37.0	4.6	
10	16318	0	0	15530	-89	788	-9	-49.4	39.0	-10.4	37.0	2.0	
11	16232	0	0	15439	-91	793	5	-43.4	39.0	-4.4	37.0	2.0	
12	16159	0	0	15360	-79	799	6	-36.8	39.0	2.2	37.0	2.0	
13	16081	0	0	15280	-80	801	2	-39.3	39.0	-0.3	37.0	2.0	
14	15999	0	0	15200	-80	799	-2	-41.3	39.0	-2.3	37.0	2.0	
15	15915	0	0	15113	-87	802	3	-42.4	39.0	-3.4	37.0	2.0	
16	15834	0	0	15033	-80	801	-1	-40.8	40.4	-0.4	37.0	3.4	
17	15792	0	0	14988	-45	804	3	-21.2	40.9	19.7	37.0	3.9	
18	15704	0	0	14903	-85	801	-3	-44.4	41.0	-3.4	37.0	4.0	
19	15672	0	0	14873	-30	799	-2	-16.1	41.9	25.8	37.0	4.9	
20	15622	0	0	14820	-53	802	3	-25.2	40.1	14.9	37.0	3.1	
21	15566	0	0	14765	-55	801	-1	-28.2	39.2	11.0	37.0	2.2	
22	15484	0	0	14713	-52	771	-30	-41.3	51.5	10.2	45.0	6.5	
23	15368	0	0	14642	-71	726	-45	-58.5	63.3	4.8	54.0	9.3	
24	15259	0	0	14582	-60	677	-49	-55.0	63.3	8.3	54.0	9.3	
25	15142	0	0	14519	-63	623	-54	-59.0	72.0	13.0	65.0	7.0	
26	15054	0	0	14500	-19	554	-69	-44.4	75.7	31.3	70.0	5.7	
27	14916	0	0	14435	-65	481	-73	-69.6	75.4	5.8	70.0	5.4	
28	14806	0	0	14387	-48	419	-62	-55.5	71.3	15.8	66.0	5.3	
29	14689	0	0	14316	-71	373	-46	-59.0	64.4	5.4	59.0	5.4	
30	14577	0	0	14251	-65	326	-47	-56.5	64.3	7.8	59.0	5.3	
31	14476	0	0	14195	-56	281	-45	-50.92	64.20	13.28	59.00	5.20	
TOTAL			0		-2146		-515	-1341.59	1502.90	161.31	1383.00	119.90	TOTAL
MEAN								-43.28	48.48	5.20	44.61	3.87	MEAN
MAX.								-16.13	75.70	31.33	70.00	9.30	MAX
MIN.								-69.58	38.10	-10.41	36.00	2.00	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2981

TOTAL NATURAL FLOW IN ACRE FEET 320

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF NOVEMBER 2004 — W.Y. 2005

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	14435	0	0	14185	-10	250	-11	-10.6	53.2	42.6	48.0	5.2	
2	14377	0	0	14160	-25	217	-33	-29.2	18.1	-11.1	13.0	5.1	
3	14344	0	0	14130	-30	214	-3	-16.6	19.5	2.9	15.0	4.5	
4	14303	0	0	14090	-40	213	-1	-20.7	38.5	17.8	34.0	4.5	
5	14247	0	0	14036	-54	211	-2	-28.2	38.5	10.3	34.0	4.5	
6	14192	0	0	13985	-51	207	-4	-27.7	38.8	11.1	34.0	4.8	
7	14159	0	0	13953	-32	206	-1	-16.6	38.9	22.3	34.0	4.9	
8	14120	0	0	13914	-39	206	0	-19.7	39.1	19.4	34.0	5.1	
9	14077	0	0	13874	-40	203	-3	-21.7	39.1	17.4	34.0	5.1	
10	14021	0	0	13821	-53	200	-3	-28.2	38.9	10.7	34.0	4.9	
11	13965	0	0	13767	-54	198	-2	-28.2	38.9	10.7	34.0	4.9	
12	13912	0	0	13717	-50	195	-3	-26.7	39.0	12.3	34.0	5.0	
13	13856	0	0	13664	-53	192	-3	-28.2	38.9	10.7	34.0	4.9	
14	13791	0	0	13611	-53	180	-12	-32.8	38.9	6.1	34.0	4.9	
15	13747	0	0	13561	-50	186	6	-22.2	38.9	16.7	34.0	4.9	
16	13677	0	0	13498	-63	179	-7	-35.3	38.9	3.6	34.0	4.9	
17	13616	0	0	13442	-56	174	-5	-30.8	38.9	8.1	34.0	4.9	
18	13568	0	0	13397	-45	171	-3	-24.2	38.9	14.7	34.0	4.9	
19	13507	0	0	13336	-61	171	0	-30.8	38.9	8.1	34.0	4.9	
20	13462	0	0	13293	-43	169	-2	-22.7	38.9	16.2	34.0	4.9	
21	13393	0	0	13229	-64	164	-5	-34.8	38.9	4.1	34.0	4.9	
22	13337	0	0	13176	-53	161	-3	-28.2	38.8	10.6	34.0	4.8	
23	13274	0	0	13116	-60	158	-3	-31.8	38.8	7.0	34.0	4.8	
24	13210	0	0	13055	-61	155	-3	-32.3	38.8	6.5	34.0	4.8	
25	13148	0	0	12997	-58	151	-4	-31.3	38.8	7.5	34.0	4.8	
26	13094	0	0	12947	-50	147	-4	-27.2	38.8	11.6	34.0	4.8	
27	13060	0	0	12912	-35	148	1	-17.1	38.8	21.7	34.0	4.8	
28	12990	0	0	12845	-67	145	-3	-35.3	38.8	3.5	34.0	4.8	
29	12937	0	0	12795	-50	142	-3	-26.7	38.8	12.1	34.0	4.8	
30	12868	0	0	12729	-66	139	-3	-34.8	38.8	4.0	34.0	4.8	
31													
TOTAL			0		-1466		-122	-800.62	1139.80	339.18	994.00	145.80	TOTAL
MEAN								-26.69	37.99	11.31	33.13	4.86	MEAN
MAX.								-10.59	53.20	42.61	48.00	5.20	MAX
MIN.								-35.29	18.10	-11.14	13.00	4.50	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2261

TOTAL NATURAL FLOW IN ACRE FEET 673

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF DECEMBER** **2004** **W.Y. 2005**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	12798	0	0	12668	-61	130	-9	-35.3	38.3	3.0	34.0	4.3	
2	12736	0	0	12609	-59	127	-3	-31.3	38.2	6.9	34.0	4.2	
3	12675	0	0	12551	-58	124	-3	-30.8	38.2	7.4	34.0	4.2	
4	12612	0	0	12491	-60	121	-3	-31.8	38.2	6.4	34.0	4.2	
5	12543	0	0	12425	-66	118	-3	-34.8	38.1	3.3	34.0	4.1	
6	12470	0	0	12355	-70	115	-3	-36.8	38.1	1.3	34.0	4.1	
7	12456	0	0	12341	-14	115	0	-7.1	38.1	31.0	34.0	4.1	
8	12397	0	0	12284	-57	113	-2	-29.7	38.1	8.4	34.0	4.1	
9	12324	0	0	12215	-69	109	-4	-36.8	38.1	1.3	34.0	4.1	
10	12257	0	0	12151	-64	106	-3	-33.8	38.1	4.3	34.0	4.1	
11	12192	0	0	12089	-62	103	-3	-32.8	38.0	5.2	34.0	4.0	
12	12146	0	0	12045	-44	101	-2	-23.2	38.0	14.8	34.0	4.0	
13	12073	0	0	11975	-70	98	-3	-36.8	38.0	1.2	34.0	4.0	
14	12018	0	0	11923	-52	95	-3	-27.7	38.1	10.4	34.0	4.1	
15	11947	0	0	11855	-68	92	-3	-35.8	38.1	2.3	34.0	4.1	
16	11888	0	0	11798	-57	90	-3	-30.1	38.0	7.9	34.0	4.0	
17	11827	0	0	11740	-58	87	-3	-30.7	38.0	7.3	34.0	4.0	
18	11762	0	0	11678	-62	84	-3	-32.5	38.0	5.5	34.0	4.0	
19	11697	0	0	11615	-63	82	-3	-33.1	38.0	4.9	34.0	4.0	
20	11635	0	0	11556	-59	79	-3	-31.2	38.0	6.8	34.0	4.0	
21	11572	0	0	11496	-60	76	-3	-31.5	38.0	6.5	34.0	4.0	
22	11504	0	0	11431	-65	73	-3	-34.4	38.0	3.6	34.0	4.0	
23	11446	0	0	11375	-56	71	-3	-29.5	38.0	8.5	34.0	4.0	
24	11384	0	0	11316	-59	68	-3	-31.1	38.0	6.9	34.0	4.0	
25	11320	0	0	11254	-62	66	-2	-32.4	37.9	5.5	34.0	3.9	
26	11253	0	0	11190	-64	63	-3	-33.6	37.6	4.0	34.0	3.6	
27	11201	0	0	11139	-51	62	-2	-26.5	37.9	11.4	34.0	3.9	
28	11158	0	0	11096	-43	62	0	-21.7	38.0	16.3	34.0	4.0	
29	11133	0	0	11073	-23	60	-1	-12.2	38.0	25.8	34.0	4.0	
30	11129	0	0	11065	-8	64	3	-2.3	37.8	35.5	34.0	3.8	
31	11126	0	0	11060	-5	66	3	-1.21	38.10	36.89	34.00	4.10	
TOTAL			0		-1669		-73	-878.06	1179.00	300.94	1054.00	125.00	TOTAL
MEAN								-28.32	38.03	9.71	34.00	4.03	MEAN
MAX.								-1.21	38.30	36.89	34.00	4.30	MAX
MIN.								-36.80	37.60	1.25	34.00	3.60	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 2339

TOTAL NATURAL FLOW IN ACRE FEET 597

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF JANUARY 2005 — W.Y. 2005

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	11078	0	0	11014	-46	64	-2	-24.0	37.9	13.9	34.0	3.9	
2	11021	0	0	10959	-55	62	-3	-29.1	38.4	9.3	34.0	4.4	
3	11002	0	0	10941	-18	61	0	-9.2	38.0	28.8	34.0	4.0	
4	10958	0	0	10898	-43	60	-2	-22.4	37.9	15.5	34.0	3.9	
5	10904	0	0	10847	-51	57	-3	-27.4	37.9	10.5	34.0	3.9	
6	10856	0	0	10801	-46	55	-2	-23.9	37.9	14.0	34.0	3.9	
7	10871	0	0	10814	13	57	2	7.3	37.8	45.1	34.0	3.8	
8	10874	0	0	10816	2	58	1	1.6	38.9	40.5	35.0	3.9	
9	10860	0	0	10801	-15	59	1	-7.1	38.1	31.0	35.0	3.1	
10	10834	0	0	10785	-16	49	-10	-12.9	39.1	26.2	35.0	4.1	
11	10807	0	0	10760	-25	47	-2	-13.7	39.4	25.7	35.0	4.4	
12	10751	0	0	10706	-54	45	-2	-28.3	39.3	11.0	35.0	4.3	
13	10708	0	0	10666	-40	42	-3	-21.5	38.7	17.2	35.0	3.7	
14	10659	0	0	10620	-46	39	-3	-24.7	37.8	13.1	35.0	2.8	
15	10607	0	0	10569	-51	38	-2	-26.6	40.7	14.1	35.0	5.7	
16	10559	0	0	10524	-45	35	-3	-24.0	41.6	17.6	35.0	6.6	
17	10502	0	0	10468	-56	34	-1	-28.9	39.8	10.9	35.0	4.8	
18	10459	0	0	10427	-41	32	-2	-21.5	39.2	17.7	35.0	4.2	
19	10408	0	0	10377	-50	31	-1	-25.6	39.0	13.4	35.0	4.0	
20	10345	0	0	10314	-63	31	-1	-32.0	39.0	7.0	35.0	4.0	
21	10297	0	0	10264	-50	33	2	-24.3	38.9	14.6	35.0	3.9	
22	10239	0	0	10206	-58	33	0	-29.1	38.8	9.7	35.0	3.8	
23	10184	0	0	10151	-55	33	0	-27.6	38.0	10.4	35.0	3.0	
24	10130	0	0	10096	-55	34	1	-27.5	37.9	10.4	35.0	2.9	
25	10084	0	0	10049	-47	35	2	-22.8	37.5	14.7	35.0	2.5	
26	10056	0	0	10021	-28	35	0	-14.0	37.5	23.5	35.0	2.5	
27	10011	0	0	9974	-47	37	2	-22.9	38.0	15.1	35.0	3.0	
28	9957	0	0	9919	-55	38	1	-27.0	38.9	11.9	35.0	3.9	
29	9908	0	0	9870	-49	38	0	-24.8	38.2	13.4	35.0	3.2	
30	9850	0	0	9812	-58	38	-1	-29.5	37.9	8.4	35.0	2.9	
31	9803	0	0	9765	-47	38	0	-23.7	58.5	34.8	56.0	2.5	
TOTAL			0		-1295		-28	-667.21	1216.50	549.29	1099.00	117.50	**TOTAL**
MEAN								-21.52	39.24	17.72	35.45	3.79	**MEAN**
MAX.								7.31	58.50	45.11	56.00	6.60	**MAX**
MIN.								-32.01	37.50	6.99	34.00	2.50	**MIN**

TOTAL ACTUAL FLOW IN ACRE FEET 2413

TOTAL NATURAL FLOW IN ACRE FEET 1090

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF FEBRUARY 2005 — W.Y. 2005

DATE	TOTAL STOR.	RUSH MEADOWS storage	RUSH MEADOWS gain/loss	GEM LAKE storage	GEM LAKE gain/loss	AGNEW LAKE storage	AGNEW LAKE gain/loss	TOTAL +/- IN CFS	TOTAL CFS ACTUAL	TOTAL CFS NATURAL	FLOW THRU R.C.PLANT	AGNEW WEIR	REMARKS
1	9689	0	0	9646	-119	43	5	-57.5	75.5	18.0	73.0	2.5	
2	9546	0	0	9503	-143	43	0	-72.1	75.6	3.5	73.0	2.6	
3	9401	0	0	9358	-145	43	0	-73.1	75.5	2.4	73.0	2.5	
4	9256	0	0	9214	-144	42	-1	-72.9	75.5	2.6	73.0	2.5	
5	9112	0	0	9071	-143	41	-2	-73.0	75.5	2.5	73.0	2.5	
6	8976	0	0	8933	-138	43	2	-68.6	75.4	6.8	73.0	2.4	
7	8885	0	0	8843	-90	42	-1	-45.7	50.4	4.7	48.0	2.4	
8	8818	0	0	8778	-65	40	-2	-33.6	41.4	7.8	39.0	2.4	
9	8748	0	0	8708	-70	40	0	-35.3	41.5	6.2	39.0	2.5	
10	8681	0	0	8641	-67	40	-1	-34.0	41.5	7.5	39.0	2.5	
11	8619	0	0	8578	-63	41	1	-31.4	41.5	10.1	39.0	2.5	
12	8557	0	0	8518	-60	39	-2	-31.0	41.5	10.5	39.0	2.5	
13	8490	0	0	8449	-69	41	2	-33.9	41.3	7.4	39.0	2.3	
14	8369	0	0	8330	-119	39	-2	-61.0	61.3	0.3	59.0	2.3	
15	8289	0	0	8248	-82	41	2	-40.5	58.4	17.9	56.0	2.4	
16	8228	0	0	8187	-61	41	0	-30.8	42.5	11.7	40.0	2.5	
17	8166	0	0	8125	-62	41	0	-31.3	42.6	11.3	40.0	2.6	
18	8107	0	0	8061	-64	46	5	-29.6	42.8	13.2	40.0	2.8	
19	8061	0	0	8016	-45	45	-1	-23.0	42.6	19.6	40.0	2.6	
20	8008	0	0	7962	-54	46	1	-26.9	42.8	15.9	40.0	2.8	
21	7962	0	0	7917	-45	45	-1	-23.3	43.0	19.7	40.0	3.0	
22	7855	0	0	7811	-106	44	0	-53.6	59.9	6.3	57.0	2.9	
23	7713	0	0	7670	-141	43	-2	-71.9	78.9	7.0	76.0	2.9	
24	7566	0	0	7523	-147	43	0	-74.0	78.9	4.9	76.0	2.9	
25	7425	0	0	7378	-145	47	4	-71.1	78.8	7.7	76.0	2.8	
26	7289	0	0	7243	-135	46	-1	-68.3	78.8	10.5	76.0	2.8	
27	7147	0	0	7100	-143	47	1	-71.7	78.6	6.9	76.0	2.6	
28	7009	0	0	6962	-138	47	0	-69.6	77.7	8.1	75.0	2.7	
29													
30													
31													
TOTAL			0		-2803		9	-1408.64	1659.70	251.06	1587.00	72.70	TOTAL
MEAN								-50.31	59.28	8.97	56.68	2.60	MEAN
MAX.								-23.04	78.90	19.71	76.00	3.00	MAX
MIN.								-73.96	41.30	0.35	39.00	2.30	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 3292

TOTAL NATURAL FLOW IN ACRE FEET 498

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA | **MONTH OF MARCH** | **2005** | **W.Y. 2005**

DATE	TOTAL STOR.	RUSH MEADOWS storage	RUSH MEADOWS gain/loss	GEM LAKE storage	GEM LAKE gain/loss	AGNEW LAKE storage	AGNEW LAKE gain/loss	TOTAL +/- IN CFS	TOTAL CFS ACTUAL	TOTAL CFS NATURAL	FLOW THRU R.C.PLANT	AGNEW WEIR	REMARKS
1	6856	0	0	6815	-147	41	-7	-77.4	79.2	1.8	76.0	3.2	
2	6714	0	0	6674	-141	40	0	-71.2	78.6	7.4	76.0	2.6	
3	6563	0	0	6522	-152	41	1	-76.4	78.7	2.3	76.0	2.7	
4	6422	0	0	6381	-141	41	0	-71.2	78.7	7.5	76.0	2.7	
5	6271	0	0	6230	-151	41	0	-76.1	78.7	2.6	76.0	2.7	
6	6121	0	0	6080	-150	41	0	-75.5	78.6	3.1	76.0	2.6	
7	5973	0	0	5932	-148	41	1	-74.4	78.5	4.1	76.0	2.5	
8	5824	0	0	5782	-150	42	1	-75.1	78.5	3.4	76.0	2.5	
9	5685	0	0	5641	-141	44	1	-70.4	78.6	8.2	76.0	2.6	
10	5543	0	0	5498	-143	45	2	-71.3	78.7	7.4	76.0	2.7	
11	5416	0	0	5371	-127	45	0	-63.9	78.9	15.0	76.0	2.9	
12	5290	0	0	5244	-127	46	1	-63.5	79.0	15.5	76.0	3.0	
13	5168	0	0	5121	-123	47	1	-61.6	79.1	17.5	76.0	3.1	
14	5051	0	0	5003	-118	48	1	-59.1	78.1	19.0	75.0	3.1	
15	4925	0	0	4877	-126	48	0	-63.7	78.1	14.4	75.0	3.1	
16	4802	0	0	4754	-123	48	0	-62.0	78.0	16.0	75.0	3.0	
17	4660	0	0	4613	-141	47	-1	-71.5	77.9	6.4	75.0	2.9	
18	4517	0	0	4476	-137	41	-5	-71.8	78.0	6.2	75.0	3.0	
19	4393	0	0	4351	-125	42	1	-62.8	78.0	15.2	75.0	3.0	
20	4268	0	0	4225	-126	43	1	-63.2	78.0	14.8	75.0	3.0	
21	4115	0	0	4074	-151	41	-1	-76.8	78.0	1.2	75.0	3.0	
22	4025	0	0	3980	-94	45	3	-45.7	78.4	32.7	75.0	3.4	
23	3886	0	0	3841	-139	45	0	-70.1	78.6	8.5	75.0	3.6	
24	3743	0	0	3699	-142	44	-1	-71.8	80.4	8.6	75.0	5.4	
25	3603	0	0	3559	-140	44	0	-70.7	79.8	9.1	75.0	4.8	
26	3455	0	0	3412	-147	43	-1	-74.4	78.7	4.3	75.0	3.7	
27	3333	0	0	3290	-122	43	-1	-61.8	77.8	16.0	75.0	2.8	
28	3190	0	0	3146	-144	44	1	-72.2	78.4	6.2	75.0	3.4	
29	3045	0	0	3003	-143	42	-1	-72.7	79.1	6.4	75.0	4.1	
30	2895	0	0	2853	-150	42	0	-75.7	78.5	2.8	75.0	3.5	
31	2752	0	0	2710	-143	42	-1	-72.3	78.1	5.8	75.0	3.1	
TOTAL			0		-4252		-5	-2146	2436	289	2338	98	TOTAL
MEAN								-69	79	9	75	3	MEAN
MAX.								-46	80	33	76	5	MAX
MIN.								-77	78	1	75	3	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 4831

TOTAL NATURAL FLOW IN ACRE FEET 574

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF APRIL — 2005 — W.Y. 2005

DATE	TOTAL STOR.	RUSH MEADOWS storage	RUSH MEADOWS gain/loss	GEM LAKE storage	GEM LAKE gain/loss	AGNEW LAKE storage	AGNEW LAKE gain/loss	TOTAL +/- IN CFS	TOTAL CFS ACTUAL	TOTAL CFS NATURAL	FLOW THRU R.C.PLANT	AGNEW WEIR	REMARKS
1	2599	0	0	2558	-152	41	-1	-76.9	78.0	1.1	75.0	3.0	
2	2460	0	0	2413	-145	47	6	-70.2	78.0	7.8	75.0	3.0	
3	2318	0	0	2270	-143	48	1	-71.7	77.7	6.0	75.0	2.7	
4	2234	0	0	2186	-84	48	0	-42.1	59.0	16.9	56.0	3.0	
5	2161	0	0	2112	-74	49	1	-36.9	43.1	6.2	40.0	3.1	
6	2124	0	0	2073	-39	51	2	-18.6	43.1	24.5	40.0	3.1	
7	2083	0	0	2031	-42	52	1	-20.7	42.9	22.2	40.0	2.9	
8	2046	0	0	1999	-32	47	-6	-19.1	43.0	23.9	40.0	3.0	
9	2041	0	0	1994	-5	47	1	-2.3	33.0	30.7	30.0	3.0	
10	2031	0	0	1984	-10	47	0	-5.0	25.2	20.2	22.0	3.2	
11	2042	0	0	1994	10	48	1	5.3	20.0	25.3	17.0	3.0	
12	2065	0	0	2016	22	49	1	11.7	17.9	29.6	15.0	2.9	
13	2069	0	0	2020	4	49	0	2.1	17.8	19.9	15.0	2.8	
14	2077	0	0	2028	8	49	1	4.3	18.2	22.5	15.0	3.2	
15	2091	0	0	2041	13	50	1	7.0	18.2	25.2	15.0	3.2	
16	2120	0	0	2069	28	51	1	14.6	18.1	32.7	15.0	3.1	
17	2166	0	0	2112	43	54	3	23.1	18.0	41.1	15.0	3.0	
18	2213	0	0	2158	46	55	1	23.4	18.1	41.5	15.0	3.1	
19	2270	0	0	2214	56	56	1	28.7	18.2	46.9	15.0	3.2	
20	2300	0	0	2244	30	56	1	15.4	21.2	36.6	18.0	3.2	
21	2319	0	0	2262	18	57	1	9.6	26.2	35.8	23.0	3.2	
22	2336	0	0	2280	18	56	-1	8.5	26.2	34.7	23.0	3.2	
23	2343	0	0	2286	6	57	1	3.4	26.2	29.6	23.0	3.2	
24	2345	0	0	2288	2	57	1	1.3	26.1	27.4	23.0	3.1	
25	2353	0	0	2294	6	59	2	4.0	26.2	30.2	23.0	3.2	
26	2373	0	0	2313	19	60	1	10.2	26.2	36.4	23.0	3.2	
27	2419	0	0	2357	44	62	2	23.1	26.2	49.3	23.0	3.2	
28	2468	0	0	2405	48	63	1	24.6	26.2	50.8	23.0	3.2	
29	2507	0	0	2442	37	65	2	19.6	26.3	45.9	23.0	3.3	
30	2564	0	0	2497	55	67	2	28.9	26.3	55.2	23.0	3.3	
31													
TOTAL			0		-213		25	-94.73	970.80	876.07	878.00	92.80	TOTAL
MEAN								-3.16	32.36	29.20	29.27	3.09	MEAN
MAX.								28.94	78.00	55.24	75.00	3.30	MAX
MIN.								-76.94	17.80	1.06	15.00	2.70	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 1926

TOTAL NATURAL FLOW IN ACRE FEET 1738

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF MAY — 2005 — W.Y. 2005

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	2633	1	1	2566	69	66	25	47.6	26.3	73.9	23.0	3.3	
2	2730	10	9	2651	85	69	4	49.3	26.4	75.7	23.0	3.4	
3	2861	30	20	2756	105	75	6	65.9	25.9	91.8	23.0	2.9	
4	3003	50	20	2871	115	82	7	71.4	31.5	102.9	29.0	2.5	
5	3115	80	30	2944	73	91	10	56.7	52.6	109.3	50.0	2.6	
6	3158	110	30	2950	6	98	7	21.5	64.4	85.9	62.0	2.4	
7	3179	160	50	2916	-34	103	5	10.7	73.0	83.7	61.0	12.0	
8	3243	210	50	2920	4	113	10	32.3	64.5	96.8	62.0	2.5	
9	3286	260	50	2906	-14	120	7	21.7	64.7	86.4	62.0	2.7	
10	3275	300	40	2849	-57	126	6	-5.5	64.3	58.8	62.0	2.3	
11	3299	350	50	2810	-39	139	13	12.1	64.6	76.7	62.0	2.6	
12	3321	410	60	2764	-46	147	8	11.1	63.6	74.7	61.0	2.6	
13	3428	480	70	2792	28	156	9	53.9	63.8	117.7	61.0	2.8	
14	3633	560	80	2906	114	167	11	103.4	63.8	167.2	61.0	2.8	
15	4040	710	150	3144	238	186	19	205.2	64.9	270.1	62.0	2.9	
16	4728	860	150	3639	495	229	43	346.9	77.3	424.2	74.0	3.3	
17	5187	1000	140	3932	293	255	26	231.4	93.9	325.3	91.0	2.9	
18	5678	1140	140	4255	323	283	28	247.5	106.9	354.4	104.0	2.9	
19	6227	1280	140	4628	373	319	36	276.8	106.9	383.7	104.0	2.9	
20	6812	1420	140	5035	407	357	38	294.9	106.8	401.7	104.0	2.8	
21	7378	1560	140	5426	391	392	35	285.4	107.2	392.6	104.0	3.2	
22	7954	1700	140	5829	403	425	33	290.4	107.2	397.6	104.0	3.2	
23	8547	1840	140	6248	419	459	34	299.0	107.2	406.2	104.0	3.2	
24	9146	1980	140	6674	426	492	33	302.0	107.3	409.3	104.0	3.3	
25	9767	2120	140	7121	447	526	34	313.1	107.4	420.5	104.0	3.4	
26	10435	2260	140	7609	488	566	40	336.8	108.2	445.0	104.0	4.2	
27	11093	2355	95	8127	518	611	45	331.7	108.9	440.6	104.0	4.9	
28	11914	2600	245	8658	531	656	45	413.9	108.8	522.7	104.0	4.8	
29	12452	2656	56	9102	444	694	38	271.2	108.8	380.0	104.0	4.8	
30	12897	2646	-10	9525	423	726	32	224.4	109.1	333.5	104.0	5.1	
31	13528	2763	117	10001	476	764	38	318.13	109.20	427.33	104.00	5.20	
TOTAL			2763		7504		723	5540.79	2495.40	8036.19	2385.00	110.40	**TOTAL**
MEAN								178.74	80.50	259.23	76.94	3.56	**MEAN**
MAX.								413.92	109.20	522.72	104.00	12.00	**MAX**
MIN.								-5.55	25.90	58.75	23.00	2.30	**MIN**

TOTAL ACTUAL FLOW IN ACRE FEET 4950

TOTAL NATURAL FLOW IN ACRE FEET 15940

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS

RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF JUNE** **2005** **W.Y. 2005**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	14261	2945	182	10508	507	808	44	369.6	108.5	478.1	103.0	5.5	
2	14848	3046	101	10986	478	816	8	295.9	125.0	420.9	103.0	22.0	
3	15320	3070	24	11434	448	816	0	238.0	127.0	365.0	103.0	24.0	
4	15834	3127	57	11892	458	815	-1	259.1	126.0	385.1	103.0	23.0	
5	16293	3140	13	12338	446	815	0	231.4	125.0	356.4	103.0	22.0	
6	16548	3005	-135	12729	391	814	-1	128.6	124.0	252.6	103.0	21.0	
7	16568	2859	-146	12880	151	829	15	10.1	186.0	196.1	103.0	83.0	
8	16408	2763	-96	12816	-64	829	0	-80.7	292.0	211.3	103.0	189.0	
9	16385	2769	6	12787	-29	829	0	-11.6	286.0	274.4	103.0	183.0	
10	16525	2888	119	12808	21	829	0	70.6	287.0	357.6	103.0	184.0	
11	16710	3040	152	12840	32	830	1	93.3	290.0	383.3	103.0	187.0	
12	16901	3187	147	12883	43	831	1	96.3	291.0	387.3	103.0	188.0	
13	17198	3410	223	12957	74	831	0	149.7	294.0	443.7	103.0	191.0	
14	17664	3765	355	13068	111	831	0	234.9	298.0	532.9	103.0	195.0	
15	18124	4097	332	13195	127	832	1	231.9	302.0	533.9	103.0	199.0	
16	18413	4270	173	13312	117	831	-1	145.7	299.0	444.7	103.0	196.0	
17	18400	4231	-39	13336	24	833	2	-6.6	292.0	285.4	103.0	189.0	
18	18217	4075	-156	13309	-27	833	0	-92.3	290.0	197.7	103.0	187.0	
19	18045	3931	-144	13280	-29	834	1	-86.7	288.0	201.3	103.0	185.0	
20	18054	3941	10	13277	-3	836	2	4.5	290.0	294.5	103.0	187.0	
21	18156	4021	80	13298	21	837	1	51.4	292.0	343.4	103.0	189.0	
22	18305	4122	101	13344	46	839	2	75.1	294.0	369.1	103.0	191.0	
23	18471	4241	119	13391	47	839	0	83.7	295.0	378.7	103.0	192.0	
24	18608	4339	98	13429	38	840	1	69.1	295.0	364.1	103.0	192.0	
25	18676	4385	46	13450	21	841	1	34.3	294.0	328.3	103.0	191.0	
26	18752	4449	64	13461	11	842	1	38.3	294.0	332.3	103.0	191.0	
27	18830	4513	64	13474	13	843	1	39.3	293.0	332.3	103.0	190.0	
28	18941	4598	85	13498	24	845	2	56.0	294.0	350.0	103.0	191.0	
29	19144	4758	160	13540	42	846	1	102.3	296.0	398.3	103.0	193.0	
30	19455	4990	232	13617	77	848	2	156.8	290.0	446.8	95.0	195.0	
31													
TOTAL			2227		3616		84	2988.20	7657.50	10645.70	3082.00	4575.50	TOTAL
MEAN								99.61	255.25	354.86	102.73	152.52	MEAN
MAX.								369.55	302.00	533.92	103.00	199.00	MAX
MIN.								-92.26	108.50	196.08	95.00	5.50	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 15189

TOTAL NATURAL FLOW IN ACRE FEET 21116

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF JULY — 2005 — W.Y. 2005

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	19868	5317	327	13704	87	847	-1	208.2	300.0	508.2	102.0	198.0	
2	20230	5431	114	13951	247	848	1	182.5	302.0	484.5	102.0	200.0	
3	20466	5390	-41	14227	276	849	1	119.0	301.0	420.0	102.0	199.0	
4	20638	5379	-11	14414	187	845	-4	86.7	301.0	387.7	102.0	199.0	
5	20872	5426	47	14623	209	823	-22	118.0	303.0	421.0	102.0	201.0	
6	21220	5461	35	14942	319	817	-6	175.5	271.0	446.5	98.0	173.0	
7	21727	5461	0	15448	506	818	1	255.6	237.0	492.6	102.0	135.0	
8	22115	5418	-43	15879	431	818	0	195.6	239.0	434.6	102.0	137.0	
9	22386	5379	-39	16188	309	819	1	136.6	237.0	373.6	102.0	135.0	
10	22640	5375	-4	16444	256	821	2	128.1	237.0	365.1	103.0	134.0	
11	22916	5394	19	16700	256	822	1	139.2	236.0	375.2	102.0	134.0	
12	23141	5390	-4	16918	218	833	11	113.4	268.0	381.4	102.0	166.0	
13	23385	5463	73	17117	199	805	-28	123.0	258.0	381.0	103.0	155.0	
14	23669	5448	-15	17404	287	817	12	143.2	146.0	289.2	103.0	43.0	
15	23753	5445	-3	17481	77	827	10	42.4	246.0	288.4	103.0	143.0	
16	23770	5443	-2	17498	17	829	2	8.6	280.0	288.6	102.0	178.0	
17	23769	5439	-4	17500	2	830	1	-0.5	287.0	286.5	101.0	186.0	
18	23752	5431	-8	17492	-8	829	-1	-8.6	285.0	276.4	101.0	184.0	
19	23685	5396	-35	17461	-31	828	-1	-33.8	267.0	233.2	101.0	166.0	
20	23643	5394	-2	17424	-37	825	-3	-21.2	234.0	212.8	101.0	133.0	
21	23660	5396	2	17438	14	826	1	8.6	217.0	225.6	96.0	121.0	
22	23665	5403	7	17435	-3	827	1	2.5	225.0	227.5	101.0	124.0	
23	23606	5362	-41	17418	-17	826	-1	-29.7	220.0	190.3	101.0	119.0	
24	23538	5338	-24	17378	-40	822	-4	-34.3	193.0	158.7	101.0	92.0	
25	23456	5304	-34	17333	-45	819	-3	-41.3	167.0	125.7	101.0	66.0	
26	23385	5273	-31	17296	-37	816	-3	-35.8	144.0	108.2	101.0	43.0	
27	23352	5260	-13	17277	-19	815	-1	-16.6	130.0	113.4	101.0	29.0	
28	23355	5308	48	17234	-43	813	-2	1.5	117.0	118.5	95.0	22.0	
29	23373	5342	34	17220	-14	811	-2	9.1	113.0	122.1	99.0	14.0	
30	23353	5332	-10	17209	-11	812	1	-10.1	108.9	98.8	99.0	9.9	
31	23340	5329	-3	17201	-8	810	-2	-6.55	108.00	101.45	99.00	9.00	
TOTAL			339		3584		-38	1958.69	6977.90	8936.59	3130.00	3847.90	TOTAL
MEAN								63.18	225.09	288.28	100.97	124.13	MEAN
MAX.								255.61	303.00	508.22	103.00	201.00	MAX
MIN.								-41.34	108.00	98.82	95.00	9.00	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 13841

TOTAL NATURAL FLOW IN ACRE FEET 17726

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA — MONTH OF AUGUST 2005 — W.Y. 2005

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	23300	5319	-10	17175	-26	806	-4	-20.2	107.4	87.2	99.0	8.4	
2	23264	5323	4	17136	-39	805	-1	-18.2	103.6	85.4	99.0	4.6	
3	23200	5323	0	17069	-67	808	3	-32.3	101.3	69.0	99.0	2.3	
4	23139	5321	-2	17007	-62	811	3	-30.8	101.5	70.7	99.0	2.5	
5	23075	5325	4	16937	-70	813	2	-32.3	101.9	69.6	99.0	2.9	
6	23014	5332	7	16868	-69	814	1	-30.8	101.9	71.1	99.0	2.9	
7	22960	5334	2	16812	-56	814	0	-27.2	102.4	75.2	99.0	3.4	
8	22926	5332	-2	16781	-31	813	-1	-17.1	91.8	74.7	88.0	3.8	
9	22903	5329	-3	16762	-19	812	-1	-11.6	77.5	65.9	74.0	3.5	
10	22885	5321	-8	16753	-9	811	-1	-9.1	77.1	68.0	74.0	3.1	
11	22850	5314	-7	16725	-28	811	0	-17.6	72.7	55.1	70.0	2.7	
12	22820	5304	-10	16705	-20	811	0	-15.1	65.1	50.0	62.0	3.1	
13	22811	5299	-5	16700	-5	812	1	-4.5	51.1	46.6	49.0	2.1	
14	22800	5290	-9	16697	-3	813	1	-5.5	48.4	42.9	46.0	2.4	
15	22873	5327	37	16731	34	815	2	36.8	50.2	87.0	46.0	4.2	
16	22913	5323	-4	16776	45	814	-1	20.2	49.5	69.7	46.0	3.5	
17	22919	5312	-11	16795	19	812	-2	3.0	49.6	52.6	46.0	3.6	
18	22917	5303	-9	16803	8	811	-1	-1.0	49.5	48.5	46.0	3.5	
19	22905	5293	-10	16801	-2	811	0	-6.1	48.3	42.2	46.0	2.3	
20	22881	5280	-13	16790	-11	811	0	-12.1	48.5	36.4	46.0	2.5	
21	22856	5267	-13	16778	-12	811	0	-12.6	48.6	36.0	46.0	2.6	
22	22824	5252	-15	16756	-22	816	5	-16.1	49.4	33.3	46.0	3.4	
23	22796	5236	-16	16745	-11	815	-1	-14.1	46.5	32.4	39.0	7.5	
24	22776	5216	-20	16745	0	815	0	-10.1	42.4	32.3	35.0	7.4	
25	22748	5192	-24	16742	-3	814	-1	-14.1	38.1	24.0	31.0	7.1	
26	22729	5166	-26	16747	5	816	2	-9.6	35.7	26.1	29.0	6.7	
27	22699	5136	-30	16747	0	816	0	-15.1	35.8	20.7	29.0	6.8	
28	22671	5105	-31	16753	6	813	-3	-14.1	36.6	22.5	29.0	7.6	
29	22643	5070	-35	16759	6	814	1	-14.1	38.6	24.5	29.0	9.6	
30	22609	5052	-18	16742	-17	815	1	-17.1	32.4	15.3	29.0	3.4	
31	22573	5039	-13	16719	-23	815	0	-18.15	35.90	17.75	29.00	6.90	
TOTAL			-290		-482		5	-386.70	1939.30	1552.60	1803.00	136.30	TOTAL
MEAN								-12.47	62.56	50.08	58.16	4.40	MEAN
MAX.								36.80	107.40	87.23	99.00	9.60	MAX
MIN.								-32.27	32.40	15.26	29.00	2.10	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 3847

TOTAL NATURAL FLOW IN ACRE FEET 3080

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF SEPTEMBER** **2005** **W.Y. 2005**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	22556	5023	-16	16719	0	814	-1	-8.6	29.8	21.2	22.0	7.8	
2	22538	5003	-20	16722	3	813	-1	-9.1	25.1	16.0	18.0	7.1	
3	22505	4981	-22	16711	-11	813	0	-16.6	24.8	8.2	18.0	6.8	
4	22474	4952	-29	16708	-3	814	1	-15.6	24.4	8.8	18.0	6.4	
5	22449	4923	-29	16711	3	815	1	-12.6	24.6	12.0	18.0	6.6	
6	22440	4894	-29	16731	20	815	0	-4.5	14.6	10.1	7.5	7.1	
7	22432	4862	-32	16756	25	814	-1	-4.0	7.5	3.5	0.3	7.2	
8	22431	4828	-34	16790	34	813	-1	-0.5	7.8	7.3	0.3	7.5	
9	22429	4796	-32	16820	30	813	0	-1.0	7.9	6.8	0.4	7.5	
10	22405	4753	-43	16842	22	810	-3	-12.1	7.6	-4.5	0.4	7.2	
11	22404	4716	-37	16873	31	815	5	-0.5	5.4	4.9	0.4	5.0	
12	22321	4677	-39	16829	-44	815	0	-41.8	49.2	7.4	42.0	7.2	
13	22159	4638	-39	16705	-124	816	1	-81.7	88.4	6.7	81.0	7.4	
14	21997	4599	-39	16582	-123	816	0	-81.7	88.7	7.0	81.0	7.7	
15	21827	4498	-101	16514	-68	815	-1	-85.7	88.5	2.8	81.0	7.5	
16	21648	4325	-173	16509	-5	814	-1	-90.2	88.5	-1.7	81.0	7.5	
17	21474	4158	-167	16500	-9	816	2	-87.7	89.5	1.8	82.0	7.5	
18	21297	3991	-167	16489	-11	817	1	-89.2	88.5	-0.7	81.0	7.5	
19	21124	3826	-165	16481	-8	817	0	-87.2	89.5	2.3	82.0	7.5	
20	20951	3664	-162	16470	-11	817	0	-87.2	88.5	1.3	81.0	7.5	
21	20785	3510	-154	16458	-12	817	0	-83.7	89.5	5.8	82.0	7.5	
22	20617	3354	-156	16447	-11	816	-1	-84.7	89.5	4.8	82.0	7.5	
23	20432	3206	-148	16419	-28	807	-9	-93.3	89.5	-3.8	82.0	7.5	
24	20258	3048	-158	16397	-22	813	6	-87.7	89.5	1.8	82.0	7.5	
25	20083	2900	-148	16366	-31	817	4	-88.2	88.5	0.3	81.0	7.5	
26	19932	2760	-140	16355	-11	817	0	-76.1	88.5	12.4	81.0	7.5	
27	19778	2628	-132	16333	-22	817	0	-77.6	88.5	10.9	81.0	7.5	
28	19666	2502	-126	16347	14	817	0	-56.5	68.5	12.0	61.0	7.5	
29	19513	2374	-128	16322	-25	817	0	-77.1	83.5	6.4	76.0	7.5	
30	19340	2243	-131	16282	-40	815	-2	-87.2	90.5	3.3	83.0	7.5	
31													
TOTAL			-2796		-437		0	-1629.97	1804.72	174.75	1586.22	218.50	TOTAL
MEAN								-54.33	60.16	5.82	52.87	7.28	MEAN
MAX.								-0.50	90.50	21.23	83.00	7.80	MAX
MIN.								-93.27	5.40	-4.53	0.29	5.00	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 3580

TOTAL NATURAL FLOW IN ACRE FEET 347

SOUTHERN CALIFORNIA EDISON COMPANY
RESERVOIR AND STREAM FLOW RECORDS
RUSH CREEK

Preliminary records subject to revision

MONO COUNTY, CALIFORNIA **MONTH OF OCTOBER** **2005** **W.Y. 2006**

DATE	TOTAL	RUSH MEADOWS		GEM LAKE		AGNEW LAKE		TOTAL +/-	TOTAL CFS		FLOW THRU	AGNEW	REMARKS
	STOR.	storage	gain/loss	storage	gain/loss	storage	gain/loss	IN CFS	ACTUAL	NATURAL	R.C.PLANT	WEIR	
1	19167	2119	-124	16241	-41	807	-8	-87.2	86.5	-0.7	79.0	7.5	negative flows caused
2	18993	1985	-134	16202	-39	806	-1	-87.7	90.5	2.8	83.0	7.5	by errors in capacity
3	18814	1859	-126	16146	-56	809	3	-90.2	90.5	0.3	83.0	7.5	tables during drawdown
4	18735	1731	-128	16185	39	819	10	-39.8	38.5	-1.3	31.0	7.5	mean flow of 2.5 is
5	18669	1610	-121	16266	81	793	-26	-33.3	37.5	4.2	30.0	7.5	fairly accurate
6	18578	1492	-118	16358	92	728	-65	-45.9	85.5	39.6	78.0	7.5	
7	18438	1384	-108	16394	36	660	-68	-70.6	83.0	12.4	76.0	7.0	
8	18261	1257	-127	16414	20	590	-70	-89.2	83.0	-6.2	76.0	7.0	
9	18108	1147	-110	16436	22	525	-65	-77.1	84.0	6.9	77.0	7.0	
10	17941	1037	-110	16444	8	460	-65	-84.2	83.0	-1.2	76.0	7.0	
11	17794	929	-108	16467	23	398	-62	-74.1	82.8	8.7	76.0	6.8	
12	17641	827	-102	16481	14	333	-65	-77.1	82.8	5.7	76.0	6.8	
13	17484	726	-101	16486	5	272	-61	-79.2	82.7	3.5	76.0	6.7	
14	17390	637	-89	16514	28	239	-33	-47.4	67.6	20.2	61.0	6.6	
15	17231	529	-108	16486	-28	216	-23	-80.2	60.4	-19.8	54.0	6.4	
16	17116	438	-91	16481	-5	197	-19	-58.0	60.3	2.3	54.0	6.3	
17	16992	349	-89	16456	-25	187	-10	-62.5	72.0	9.5	66.0	6.0	
18	16817	264	-85	16369	-87	184	-3	-88.2	85.0	-3.2	80.0	5.0	
19	16651	177	-87	16294	-75	180	-4	-83.7	84.4	0.7	79.0	5.4	
20	16443	84	-94	16224	-70	135	-45	-105.1	83.4	-21.7	79.0	4.4	
21	16202	10	-74	16127	-97	66	-70	-121.1	83.1	-38.0	80.0	3.1	
22	16024	0	-10	15992	-135	32	-33	-89.7	81.0	-8.7	79.0	2.0	
23	15887	0	0	15855	-137	31	-1	-69.5	81.0	11.5	79.0	2.0	
24	15730	0	0	15698	-157	31	0	-79.2	81.0	1.8	79.0	2.0	
25	15598	0	0	15566	-132	31	0	-66.6	75.0	8.4	73.0	2.0	
26	15449	0	0	15417	-149	32	0	-75.0	81.0	6.0	79.0	2.0	
27	15304	0	0	15272	-145	31	0	-73.3	81.0	7.7	79.0	2.0	
28	15158	0	0	15126	-146	31	0	-73.6	81.0	7.4	79.0	2.0	
29	15026	0	0	14994	-132	31	0	-66.6	78.0	11.4	76.0	2.0	
30	14872	0	0	14840	-154	31	0	-77.6	81.0	3.4	79.0	2.0	
31	14721	0.3	0	14689	-151	31	0	-76.13	81.00	4.87	79.00	2.00	
TOTAL			-2243		-1593		-784	-2328.95	2407.50	78.55	2251.00	156.50	TOTAL
MEAN								-75.13	77.66	2.53	72.61	5.05	MEAN
MAX.								-33.28	90.50	39.62	83.00	7.50	MAX
MIN.								-121.10	37.50	-38.00	30.00	2.00	MIN

TOTAL ACTUAL FLOW IN ACRE FEET 4775

TOTAL NATURAL FLOW IN ACRE FEET 156